

# Optimux-108

Four-Channel E1 and Ethernet Multiplexer

Version 6.1



**data communications**

The Access Company



# Optimux-108

## Four-Channel E1 and Ethernet Multiplexer

Version 6.1

### Installation and Operation Manual

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For further information contact RAD at the address below or contact your local distributor.

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RAD warrants to DISTRIBUTOR that the hardware in the Optimux-108 to be delivered hereunder shall be free of defects in material and workmanship under normal use and service for a period of twelve (12) months following the date of shipment to DISTRIBUTOR.

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## Product Disposal



To facilitate the reuse, recycling and other forms of recovery of waste equipment in protecting the environment, the owner of this RAD product is required to refrain from disposing of this product as unsorted municipal waste at the end of its life cycle. Upon termination of the unit's use, customers should provide for its collection for reuse, recycling or other form of environmentally conscientious disposal.



# General Safety Instructions

The following instructions serve as a general guide for the safe installation and operation of telecommunications products. Additional instructions, if applicable, are included inside the manual.

## Safety Symbols



**Warning**

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This symbol may appear on the equipment or in the text. It indicates potential safety hazards regarding product operation or maintenance to operator or service personnel.

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Danger of electric shock! Avoid any contact with the marked surface while the product is energized or connected to outdoor telecommunication lines.

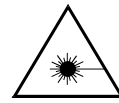
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Protective ground: the marked lug or terminal should be connected to the building protective ground bus.

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**Warning**

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Some products may be equipped with a laser diode. In such cases, a label with the laser class and other warnings as applicable will be attached near the optical transmitter. The laser warning symbol may be also attached.

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Please observe the following precautions:

- Before turning on the equipment, make sure that the fiber optic cable is intact and is connected to the transmitter.
- Do not attempt to adjust the laser drive current.
- Do not use broken or unterminated fiber-optic cables/connectors or look straight at the laser beam.
- The use of optical devices with the equipment will increase eye hazard.
- Use of controls, adjustments or performing procedures other than those specified herein, may result in hazardous radiation exposure.

**ATTENTION:** The laser beam may be invisible!

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In some cases, the users may insert their own SFP laser transceivers into the product. Users are alerted that RAD cannot be held responsible for any damage that may result if non-compliant transceivers are used. In particular, users are warned to use only agency approved products that comply with the local laser safety regulations for Class 1 laser products.

Always observe standard safety precautions during installation, operation and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance or repairs to this product. No installation, adjustment, maintenance or repairs should be performed by either the operator or the user.

# Handling Energized Products

## General Safety Practices

Do not touch or tamper with the power supply when the power cord is connected. Line voltages may be present inside certain products even when the power switch (if installed) is in the OFF position or a fuse is blown. For DC-powered products, although the voltages levels are usually not hazardous, energy hazards may still exist.

Before working on equipment connected to power lines or telecommunication lines, remove jewelry or any other metallic object that may come into contact with energized parts.

Unless otherwise specified, all products are intended to be grounded during normal use. Grounding is provided by connecting the mains plug to a wall socket with a protective ground terminal. If a ground lug is provided on the product, it should be connected to the protective ground at all times, by a wire with a diameter of 18 AWG or wider. Rack-mounted equipment should be mounted only in grounded racks and cabinets.

Always make the ground connection first and disconnect it last. Do not connect telecommunication cables to ungrounded equipment. Make sure that all other cables are disconnected before disconnecting the ground.

Some products may have panels secured by thumbscrews with a slotted head. These panels may cover hazardous circuits or parts, such as power supplies. These thumbscrews should therefore always be tightened securely with a screwdriver after both initial installation and subsequent access to the panels.

## Connecting AC Mains

Make sure that the electrical installation complies with local codes.

Always connect the AC plug to a wall socket with a protective ground.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A (20A for USA and Canada). The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A (40A for USA and Canada).

Always connect the power cord first to the equipment and then to the wall socket. If a power switch is provided in the equipment, set it to the OFF position. If the power cord cannot be readily disconnected in case of emergency, make sure that a readily accessible circuit breaker or emergency switch is installed in the building installation.

In cases when the power distribution system is IT type, the switch must disconnect both poles simultaneously.

## Connecting DC Power

Unless otherwise specified in the manual, the DC input to the equipment is floating in reference to the ground. Any single pole can be externally grounded.

Due to the high current capability of DC power systems, care should be taken when connecting the DC supply to avoid short-circuits and fire hazards.

Make sure that the DC power supply is electrically isolated from any AC source and that the installation complies with the local codes.

The maximum permissible current capability of the branch distribution circuit that supplies power to the product is 16A (20A for USA and Canada). The circuit breaker in the building installation should have high breaking capacity and must operate at short-circuit current exceeding 35A (40A for USA and Canada).

Before connecting the DC supply wires, ensure that power is removed from the DC circuit. Locate the circuit breaker of the panel board that services the equipment and switch it to the OFF position. When connecting the DC supply wires, first connect the ground wire to the corresponding terminal, then the positive pole and last the negative pole. Switch the circuit breaker back to the ON position.

A readily accessible disconnect device that is suitably rated and approved should be incorporated in the building installation.

If the DC power supply is floating, the switch must disconnect both poles simultaneously.

## Connecting Data and Telecommunications Cables

Data and telecommunication interfaces are classified according to their safety status.

The following table lists the status of several standard interfaces. If the status of a given port differs from the standard one, a notice will be given in the manual.

Ports	Safety Status
V.11, V.28, V.35, V.36, RS-530, X.21, 10 BaseT, 100 BaseT, Unbalanced E1, E2, E3, STM, DS-2, DS-3, S-Interface ISDN, Analog voice E&M	SELV Safety Extra Low Voltage: Ports which do not present a safety hazard. Usually up to 30 VAC or 60 VDC.
xDSL (without feeding voltage), Balanced E1, T1, Sub E1/T1	TNV-1 Telecommunication Network Voltage-1: Ports whose normal operating voltage is within the limits of SELV, on which overvoltages from telecommunications networks are possible.
FXS (Foreign Exchange Subscriber)	TNV-2 Telecommunication Network Voltage-2: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are not possible. These ports are not permitted to be directly connected to external telephone and data lines.
FXO (Foreign Exchange Office), xDSL (with feeding voltage), U-Interface ISDN	TNV-3 Telecommunication Network Voltage-3: Ports whose normal operating voltage exceeds the limits of SELV (usually up to 120 VDC or telephone ringing voltages), on which overvoltages from telecommunication networks are possible.

**Always connect a given port to a port of the same safety status. If in doubt, seek the assistance of a qualified safety engineer.**

Always make sure that the equipment is grounded before connecting telecommunication cables. Do not disconnect the ground connection before disconnecting all telecommunications cables.

Some SELV and non-SELV circuits use the same connectors. Use caution when connecting cables. Extra caution should be exercised during thunderstorms.

When using shielded or coaxial cables, verify that there is a good ground connection at both ends. The grounding and bonding of the ground connections should comply with the local codes.

The telecommunication wiring in the building may be damaged or present a fire hazard in case of contact between exposed external wires and the AC power lines. In order to reduce the risk, there are restrictions on the diameter of wires in the telecom cables, between the equipment and the mating connectors.

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**Caution**

To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cords.

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**Attention**

Pour réduire les risques d'incendie, utiliser seulement des conducteurs de télécommunications 26 AWG ou de section supérieure.

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Some ports are suitable for connection to intra-building or non-exposed wiring or cabling only. In such cases, a notice will be given in the installation instructions.

Do not attempt to tamper with any carrier-provided equipment or connection hardware.

## Electromagnetic Compatibility (EMC)

The equipment is designed and approved to comply with the electromagnetic regulations of major regulatory bodies. The following instructions may enhance the performance of the equipment and will provide better protection against excessive emission and better immunity against disturbances.

A good ground connection is essential. When installing the equipment in a rack, make sure to remove all traces of paint from the mounting points. Use suitable lock-washers and torque. If an external grounding lug is provided, connect it to the ground bus using braided wire as short as possible.

The equipment is designed to comply with EMC requirements when connecting it with unshielded twisted pair (UTP) cables. However, the use of shielded wires is always recommended, especially for high-rate data. In some cases, when unshielded wires are used, ferrite cores should be installed on certain cables. In such cases, special instructions are provided in the manual.

Disconnect all wires which are not in permanent use, such as cables used for one-time configuration.

The compliance of the equipment with the regulations for conducted emission on the data lines is dependent on the cable quality. The emission is tested for UTP with 80 dB longitudinal conversion loss (LCL).

Unless otherwise specified or described in the manual, TNV-1 and TNV-3 ports provide secondary protection against surges on the data lines. Primary protectors should be provided in the building installation.

The equipment is designed to provide adequate protection against electro-static discharge (ESD). However, it is good working practice to use caution when connecting cables terminated with plastic connectors (without a grounded metal hood, such as flat cables) to sensitive data lines. Before connecting such cables, discharge yourself by touching ground or wear an ESD preventive wrist strap.



## FCC-15 User Information

This equipment has been tested and found to comply with the limits of the Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the Installation and Operation manual, may cause harmful interference to the radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Canadian Emission Requirements

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulation.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

## Warning per EN 55022 (CISPR-22)

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***Warning***

This is a class A product. In a domestic environment, this product may cause radio interference, in which case the user will be required to take adequate measures.

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***Avertissement***

Cet appareil est un appareil de Classe A. Dans un environnement résidentiel, cet appareil peut provoquer des brouillages radioélectriques. Dans ces cas, il peut être demandé à l'utilisateur de prendre les mesures appropriées.

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***Achtung***

Das vorliegende Gerät fällt unter die Funkstörgrenzwertklasse A. In Wohngebieten können beim Betrieb dieses Gerätes Rundfunkstörungen auftreten, für deren Behebung der Benutzer verantwortlich ist.

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## Mise au rebut du produit



Afin de faciliter la réutilisation, le recyclage ainsi que d'autres formes de récupération d'équipement mis au rebut dans le cadre de la protection de l'environnement, il est demandé au propriétaire de ce produit RAD de ne pas mettre ce dernier au rebut en tant que déchet municipal non trié, une fois que le produit est arrivé en fin de cycle de vie. Le client devrait proposer des solutions de réutilisation, de recyclage ou toute autre forme de mise au rebut de cette unité dans un esprit de protection de l'environnement, lorsqu'il aura fini de l'utiliser.

## Instructions générales de sécurité

Les instructions suivantes servent de guide général d'installation et d'opération sécurisées des produits de télécommunications. Des instructions supplémentaires sont éventuellement indiquées dans le manuel.

## Symboles de sécurité



**Avertissement**

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Ce symbole peut apparaître sur l'équipement ou dans le texte. Il indique des risques potentiels de sécurité pour l'opérateur ou le personnel de service, quant à l'opération du produit ou à sa maintenance.

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Danger de choc électrique ! Evitez tout contact avec la surface marquée tant que le produit est sous tension ou connecté à des lignes externes de télécommunications.

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Mise à la terre de protection : la cosse ou la borne marquée devrait être connectée à la prise de terre de protection du bâtiment.

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### **Avertissement**

Certains produits peuvent être équipés d'une diode laser. Dans de tels cas, une étiquette indiquant la classe laser ainsi que d'autres avertissements, le cas échéant, sera jointe près du transmetteur optique. Le symbole d'avertissement laser peut aussi être joint.

Veuillez observer les précautions suivantes :

- Avant la mise en marche de l'équipement, assurez-vous que le câble de fibre optique est intact et qu'il est connecté au transmetteur.
- Ne tentez pas d'ajuster le courant de la commande laser.
- N'utilisez pas des câbles ou connecteurs de fibre optique cassés ou sans terminaison et n'observez pas directement un rayon laser.
- L'usage de périphériques optiques avec l'équipement augmentera le risque pour les yeux.
- L'usage de contrôles, ajustages ou procédures autres que celles spécifiées ici pourrait résulter en une dangereuse exposition aux radiations.

**ATTENTION : Le rayon laser peut être invisible !**

Les utilisateurs pourront, dans certains cas, insérer leurs propres émetteurs-récepteurs Laser SFP dans le produit. Les utilisateurs sont avertis que RAD ne pourra pas être tenue responsable de tout dommage pouvant résulter de l'utilisation d'émetteurs-récepteurs non conformes. Plus particulièrement, les utilisateurs sont avertis de n'utiliser que des produits approuvés par l'agence et conformes à la réglementation locale de sécurité laser pour les produits laser de classe 1.

Respectez toujours les précautions standards de sécurité durant l'installation, l'opération et la maintenance de ce produit. Seul le personnel de service qualifié et autorisé devrait effectuer l'ajustage, la maintenance ou les réparations de ce produit. Aucune opération d'installation, d'ajustage, de maintenance ou de réparation ne devrait être effectuée par l'opérateur ou l'utilisateur.

## **Manipuler des produits sous tension**

### **Règles générales de sécurité**

Ne pas toucher ou altérer l'alimentation en courant lorsque le câble d'alimentation est branché. Des tensions de lignes peuvent être présentes dans certains produits, même lorsque le commutateur (s'il est installé) est en position OFF ou si le fusible est rompu. Pour les produits alimentés par CC, les niveaux de tension ne sont généralement pas dangereux mais des risques de courant peuvent toujours exister.

Avant de travailler sur un équipement connecté aux lignes de tension ou de télécommunications, retirez vos bijoux ou tout autre objet métallique pouvant venir en contact avec les pièces sous tension.

Sauf s'il en est autrement indiqué, tous les produits sont destinés à être mis à la terre durant l'usage normal. La mise à la terre est fournie par la connexion de la fiche principale à une prise murale équipée d'une borne protectrice de mise à la terre. Si une cosse de mise à la terre est fournie avec le produit, elle devrait être connectée à tout moment à une mise à la terre de protection par un conducteur de diamètre 18 AWG ou plus. L'équipement monté en châssis ne devrait être monté que sur des châssis et dans des armoires mises à la terre.

Branchez toujours la mise à la terre en premier et débranchez-la en dernier. Ne branchez pas des câbles de télécommunications à un équipement qui n'est pas mis à la terre. Assurez-vous que tous les autres câbles sont débranchés avant de déconnecter la mise à la terre.

## Connexion au courant du secteur

Assurez-vous que l'installation électrique est conforme à la réglementation locale.

Branchez toujours la fiche de secteur à une prise murale équipée d'une borne protectrice de mise à la terre.

La capacité maximale permmissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A (20A aux Etats-Unis et Canada). Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A (40A aux Etats-Unis et Canada).

Branchez toujours le câble d'alimentation en premier à l'équipement puis à la prise murale. Si un commutateur est fourni avec l'équipement, fixez-le en position OFF. Si le câble d'alimentation ne peut pas être facilement débranché en cas d'urgence, assurez-vous qu'un coupe-circuit ou un disjoncteur d'urgence facilement accessible est installé dans l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si le système de distribution de courant est de type IT.

## Connexion d'alimentation CC

Sauf s'il en est autrement spécifié dans le manuel, l'entrée CC de l'équipement est flottante par rapport à la mise à la terre. Tout pôle doit être mis à la terre en externe.

A cause de la capacité de courant des systèmes à alimentation CC, des précautions devraient être prises lors de la connexion de l'alimentation CC pour éviter des courts-circuits et des risques d'incendie.

Assurez-vous que l'alimentation CC est isolée de toute source de courant CA (secteur) et que l'installation est conforme à la réglementation locale.

La capacité maximale permmissible en courant du circuit de distribution de la connexion alimentant le produit est de 16A (20A aux Etats-Unis et Canada). Le coupe-circuit dans l'installation du bâtiment devrait avoir une capacité élevée de rupture et devrait fonctionner sur courant de court-circuit dépassant 35A (40A aux Etats-Unis et Canada).

Avant la connexion des câbles d'alimentation en courant CC, assurez-vous que le circuit CC n'est pas sous tension. Localisez le coupe-circuit dans le tableau desservant l'équipement et fixez-le en position OFF. Lors de la connexion de câbles d'alimentation CC, connectez d'abord le conducteur de mise à la terre à la borne correspondante, puis le pôle positif et en dernier, le pôle négatif. Remettez le coupe-circuit en position ON.

Un disjoncteur facilement accessible, adapté et approuvé devrait être intégré à l'installation du bâtiment.

Le disjoncteur devrait déconnecter simultanément les deux pôles si l'alimentation en courant CC est flottante.

## Glossary

<b>Address</b>	A coded representation of the origin or destination of data.
<b>Agent</b>	In SNMP, this refers to the managed system.
<b>Attenuation</b>	Signal power loss through equipment, lines or other transmission devices. Measured in decibels.
<b>Balanced</b>	A transmission line in which voltages on the two conductors are equal in magnitude, but opposite in polarity, with respect to ground.
<b>Balanced Line</b>	A circuit in which neither side of the line is grounded. This minimizes crosstalk or noise pickup between pairs in the same cable.
<b>Baud</b>	Unit of signaling speed equivalent to the number of discrete conditions or events per second. If each signal event represents only one bit condition, baud rate equals bps (bits per second).
<b>Bit</b>	The smallest unit of information in a binary system. Represents either a one or zero ("1" or "0").
<b>Buffer</b>	A storage device. Commonly used to compensate for differences in data rates or event timing when transmitting from one device to another. Also used to remove jitter.
<b>Carrier</b>	A continuous signal at a fixed frequency that is capable of being modulated with a second (information carrying) signal.
<b>Cell</b>	The 53-byte basic information unit within an ATM network. The user traffic is segmented into cells at the source and reassembled at the destination. An ATM cell consists of a 5-byte ATM header and a 48-byte ATM payload, which contains the user data.
<b>Channel</b>	A path for electrical transmission between two or more points. Also called a link, line, circuit or facility.
<b>Clock</b>	A term for the source(s) of timing signals used in synchronous transmission.
<b>Control Signals</b>	Signals passing between one part of a communications system and another (such as RTS, DTR, or DCD), as part of a mechanism for controlling the system.
<b>CTS (Clear To Send)</b>	A modem interface control signal from the data communications equipment (DCE) indicating to the data terminal equipment (DTE) that it may begin data transmission.
<b>Data</b>	Information represented in digital form, including voice, text, facsimile and video.
<b>dBm</b>	A measure of power in communications: the decibel in reference to one milliwatt (0 dBm = 1 milliwatt and -30 dBm = .001 milliwatt).
<b>Diagnostics</b>	The detection and isolation of a malfunction or mistake in a communications device, network or system.

<b>Equalizer</b>	A device that compensates for distortion due to signal attenuation and propagation time with respect to frequency. It reduces the effects of amplitude, frequency and/or phase distortion.
<b>Ethernet</b>	A local area network (LAN) technology which has extended into the wide area networks. Ethernet operates at many speeds, including data rates of 10 Mbps (Ethernet), 100 Mbps (Fast Ethernet), 1,000 Mbps (Gigabit Ethernet), 10 Gbps, 40 Gbps, and 100 Gbps.
<b>Flow Control</b>	A congestion control mechanism that results in an ATM system implementing flow control.
<b>Frame</b>	A logical grouping of information sent as a link-layer unit over a transmission medium. The terms packet, datagram, segment, and message are also used to describe logical information groupings.
<b>Full Duplex</b>	A circuit or device permitting transmission in two directions (sending and receiving) at the same time.
<b>G.703</b>	An ITU standard for the physical and electrical characteristics of various digital interfaces, including those at 64 kbps and 2.048 Mbps.
<b>Gateway</b>	Gateways are points of entrance and exit from a communications network. Viewed as a physical entity, a gateway is that node that translates between two otherwise incompatible networks or network segments. Gateways perform code and protocol conversion to facilitate traffic between data highways of differing architecture.
<b>Half Duplex</b>	A circuit or device capable of transmitting in two directions, but not at the same time.
<b>Impedance</b>	The combined effect of resistance, inductance and capacitance on a transmitted signal. Impedance varies at different frequencies.
<b>Interface</b>	A shared boundary, defined by common physical interconnection characteristics, signal characteristics, and meanings of exchanged signals.
<b>IP Address</b>	Also known as an Internet address. A unique string of numbers that identifies a computer or device on a TCP/IP network. The format of an IP address is a 32-bit numeric address written as four numbers from 0 to 255, separated by periods (for example, 1.0.255.123).
<b>Jitter</b>	The deviation of a transmission signal in time or phase. It can introduce errors and loss of synchronization in high speed synchronous communications.
<b>Laser</b>	A device that transmits an extremely narrow and coherent beam of electromagnetic energy in the visible light spectrum. Used as a light source for fiber optic transmission (generally more expensive, shorter lived, single mode only, for greater distances than LED).
<b>Loopback</b>	A type of diagnostic test in which the transmitted signal is returned to the sending device after passing through all or part of a communications link or network.

<b>Manager</b>	An application that receives Simple Network Management Protocol (SNMP) information from an agent. An agent and manager share a database of information, called the Management Information Base (MIB). An agent can use a message called a traps-PDU to send unsolicited information to the manager. A manager that uses the RADview MIB can query the RAD device, set parameters, sound alarms when certain conditions appear, and perform other administrative tasks.
<b>Multimode Fiber</b>	A fiber with a large core diameter; 50-200 microns compared with the wavelength of light. It therefore propagates more than one mode. With multimode fiber, light traverses multiple paths, some longer than others. This leads to dispersion, which reduces optical range.
<b>Multiplexer</b>	At one end of a communications link, a device that combines several lower speed transmission channels into a single high speed channel. A multiplexer at the other end reverses the process. Sometimes called a mux. See <b>Bit Interleaving/Multiplexing</b> .
<b>Network</b>	(1) An interconnected group of nodes. (2) A series of points, nodes, or stations connected by communications channels; the collection of equipment through which connections are made between data stations.
<b>parameters</b>	Parameters are often called arguments, and the two words are used interchangeably. However, some computer languages such as C define argument to mean actual parameter (i.e., the value), and parameter to mean formal parameter. In RAD CLI, parameter means formal parameter, not value.
<b>Physical Layer</b>	Layer 1 of the OSI model. The layer concerned with electrical, mechanical, and handshaking procedures over the interface connecting a device to the transmission medium.
<b>Port</b>	The physical interface to a computer or multiplexer, for connection of terminals and modems.
<b>prompt</b>	One or more characters in a command line interface to indicate that the computer is ready to accept typed input.
<b>Protocol</b>	A formal set of conventions governing the formatting and relative timing of message exchange between two communicating systems.
<b>Routing</b>	The process of selecting the most efficient circuit path for a message.
<b>RTS (Request To Send)</b>	A modem control signal sent from the DTE to the modem, which tells the modem that the DTE has data to send.
<b>Single Mode</b>	Describing an optical wave-guide or fiber that is designed to propagate light of only a single wavelength (typically 5-10 microns in diameter).
<b>Sync</b>	See <b>Synchronous Transmission</b> .

<b>Telnet</b>	<p>The virtual terminal protocol in the Internet suite of protocols. It lets users on one host access another host and work as terminal users of that remote host. Instead of dialing into the computer, the user connects to it over the Internet using Telnet. When issuing a Telnet session, it connects to the Telnet host and logs in. The connection enables the user to work with the remote machine as though a terminal was connected to it.</p>
---------------	---



# Quick Start Guide

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If you are familiar with the Optimux-108, use this guide to prepare it for operation.

---

## 1. Connecting the Interface Cables

### Connecting the Tributary E1 Interfaces

- To connect the balanced E1 interface (RJ-45 connector)
  - Connect the RJ-45 connector of the cable to the E1 port.
- To connect the unbalanced E1 interface (BNC connectors)
  1. Connect the transmit cable to the coaxial connector of the E1 port marked IN.
  2. Connect the receive cable to the coaxial connector of the E1 port marked OUT.

### Connecting the V.35 Interface

- To connect the V.35 interface (Smart serial connector)
  - Connect the V.35 cable supplied with the product to the V.35 interface smart serial connector.

### Connecting the Uplink

- To connect the uplink:
  1. Clean the optical connectors using an approved solvent, and dry thoroughly using optical tissue.
  2. Connect to the two optical connectors designated TX (transmit output) and RX (receive input) of the appropriate interface.
  3. Pay attention to correct connection of the transmit and receive cables to the corresponding connectors. Avoid sharp bends and twisting of the fiber-optic cables.

---

**Note** For WDM option, only one fiber optic cable per link should be connected.

---

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## 2. Connecting the Power

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Before powering this unit and before connecting or disconnecting any other cable, the protective earth terminals of this instrument must be connected to the protective ground conductor of the mains (AC or DC) power cord. If you are using an extension cord (power cable) make sure it is grounded as well.

Any interruption of the protective grounding conductor (inside or outside the instrument) or disconnecting the protective earth terminal can make this unit dangerous. Intentional interruption is prohibited.

---

### Connecting the AC/DC Power

The Optimux-108 is supplied with a Wide Range AC/DC power supply. The wide-range AC/DC power supply accepts current from both AC and DC sources. From an AC source, the power supply can receive any voltage in the range of 100 VAC to 240 VAC. From a DC source, the -48 VDC power supply can receive any voltage in the range of -40 to -72 VDC.

This unit is equipped with a standard AC-type 3-prong power input connector located on the unit rear panel. This power input connector can be used for both AC and DC voltage inputs. AC or DC power should be supplied to Optimux-108 through the 5-feet (1.5m) standard power cable terminated by a standard 3-prong plug.

➤ **To connect Optimux-108 to AC power:**

1. Connect the power cable to the connector on the Optimux-108 rear panel.
2. Connect the power cable to the electricity outlet.

➤ **To connect Optimux-108 to -48 VDC power:**

- Refer to the DC power supply connection supplement, located on the Technical Documentation CD or at the back of the official printed version of this manual. Also, refer to the safety instructions at the beginning of this document.

### Connecting the DC Power

When connecting the DC power, the PWR pin must be connected to the ungrounded line of the central battery (either – or +). The RTN pin must be connected to the grounded line of the central battery. The GND pin must be connected to the protected earth of the building installation.

**Caution**

The DC installation procedure must be performed by a qualified technician.

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## 3. Configuring the Optimux-108

### Configuring IP Host Parameters

➤ To define the IP parameters:

1. From the Management menu, select **Host**.  
The Host menu is displayed.
2. From the Host menu, perform the following:
  - Select IP Address to define the host IP address
  - Select IP Mask to define the host IP mask
  - Select Default Gateway to set the default gateway IP address.

---

**Note**    *The default gateway must be in the same subnet as the host.*

---

### Configuring Control Port Parameters

➤ To configure the control port data rate:

1. From the Control Port menu (**Configuration>System>Control Port**), select **Baud Rate**.
2. Select the terminal rate by typing the number corresponding to the desired value, and then press <Enter>.
3. From the Control Port menu, select **Security Timeout** to set it to OFF or to 10 minutes.
4. From the Control Port menu, select **Pop Alarm** to set it to ON or to OFF.

### Configuring the MNG-ETH port

➤ To configure the MNG-ETH port:

1. From the Configuration menu select Physical Layer>**Ethernet**.
2. Select **Device Number** to set the device location (local or remote).
3. Select **Port Number** to set the Fast Ethernet port number to **ETH-MNG**.
4. Select **Auto Negotiation** to toggle between the **Enabled** and **Disabled** options.
5. Select **Flow Control** to toggle between the **Enabled** and **Disabled** options.
6. Select **Alarms** to mask or unmask the Fast Ethernet alarms. This option identifies whether alarms triggered by this Ethernet port are masked or not. When masked, these alarms are not trapped and are not recorded in the log file.



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**Appendix A. Pinouts**

**Appendix B. Boot Sequence and Downloading Software**



# Chapter 1

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## Introduction

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### 1.1 Overview

Optimux-108 is a second-order multiplexer that multiplexes four E1 channels and 100 Mbps Ethernet or V.35 link over a fiber optic link with various fiber interfaces: multimode, single-mode (up to 120 km), and single-mode over single fiber.

### Product Options

The basic model includes a fiber optic uplink and four tributary E1 links, which can be ordered with a balanced or unbalanced interface.

Optimux-108 can be also ordered with an additional Ethernet or V.35 user port, and with redundant uplink or power supply.

Optimux-108 is available in a plastic or a metal enclosure.

#### **Note**

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*In this manual, the generic term **Optimux-108** is used when the information is applicable to all the equipment versions. The complete equipment designation is used only for information applicable to specific equipment versions.*

---

### Applications

[Figure 1-1](#) illustrates a typical application of the Optimux-108 unit with Ethernet user port and [Figure 1-2](#) – of the Optimux-108 with V.35 user port.

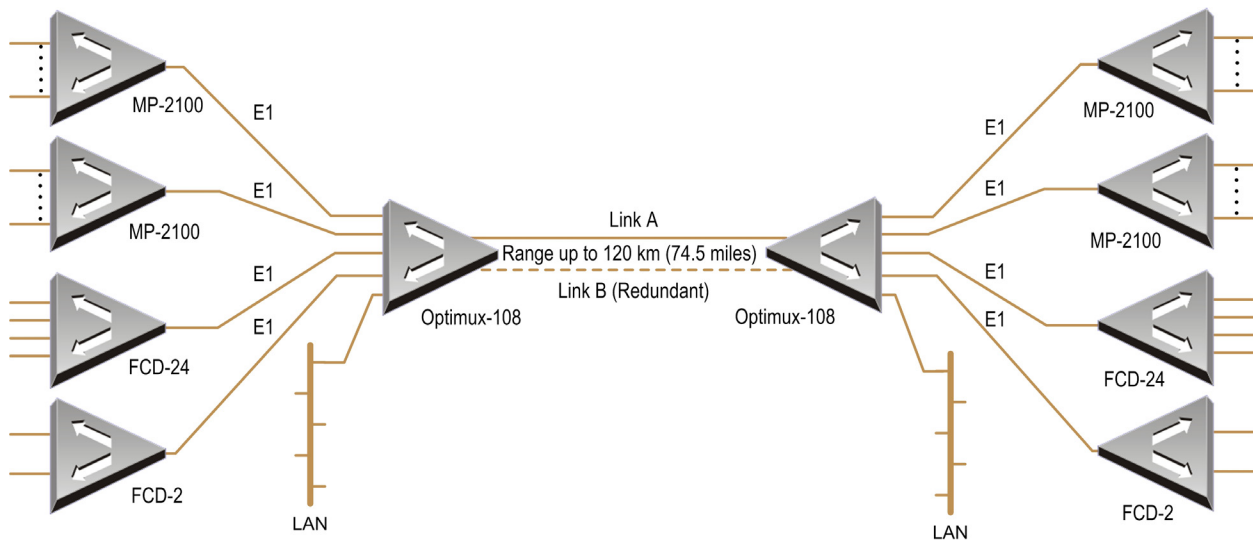


Figure 1-1. Typical Application of Optimux-108 with Ethernet Port

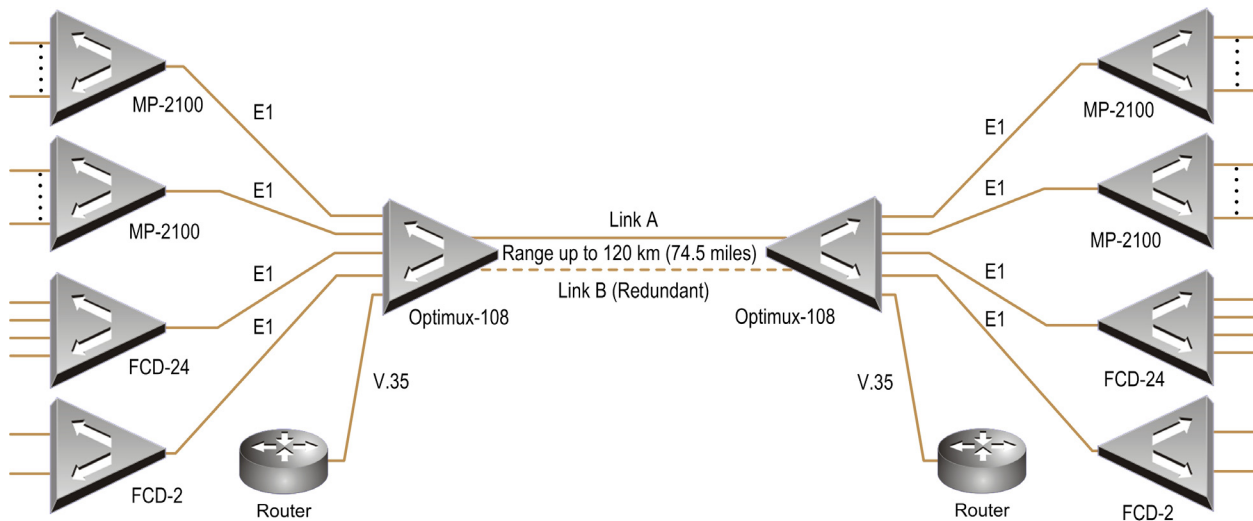


Figure 1-2. Typical Application of Optimux-108 with V.35 User Port

## Features

Various optical uplink interfaces include:

- 850 nm VCSEL (Vertical Cavity Surface Emitting Laser) for multimode fiber
- 1310 nm LED for multimode fiber
- 1310/1550 nm laser diode or long haul laser diode for extended range over single-mode fiber
- Single fiber (SF1, SF2 options) using a 1310 nm and 1550 nm laser diode transmitter with WDM technology, which enables the laser to transmit the signal at a different wavelength than the receive signal
- Single fiber (SF3 option) using SC/APC (Angled Polished Connector) technology, with a 1310 nm laser diode for single wavelength operation.

The unit can be ordered with two uplink interfaces, where the second link interface operates as a backup for the main link. The user can select automatic switching to the backup or manual selection of the desired link interface.

Optimux-108 has comprehensive test and diagnostics capabilities that include local and remote loopbacks on the uplink interface and on each E1 tributary link. A local loopback is also supported on the optional V.35 user port.

To facilitate system diagnostics, Optimux-108 features LED status indicators, AIS alarm generation and recognition, and dry contact closure upon link failure.

Optimux-108 can be powered from 100-240 VAC or -40 to -72 VDC. Two independent power supplies can be installed, for redundancy.

Optimux-108 is a compact standalone unit. A rack mount adapter kit enables installation of one or two (side-by-side) units in a 19-inch rack.

---

## 1.2 Physical Description

Optimux-108 is a 1U high, compact, easy-to-install standalone device. The front view of the Optimux-108 unit is shown in [Figure 1-3](#). The location of LEDs and connectors on the metal enclosure is similar.



*Figure 1-3. Optimux-108, 3D View*

The front panel includes LED indicators described in [Chapter 3](#).

The rear panel includes one or two uplink ports, 4 x E1 tributary interface, an optional Ethernet or V.35 user port, an Ethernet management port, a serial management port, and the power connector. The rear panel ports are described in [Chapter 2](#).

## 1.3 Functional Description

### Printed Circuit Boards

Optimux-108 contains the following printed circuit boards:

- Main board, including two tributary interfaces (BNC interface board or RJ-45 connectors) and an optional user port. This user port can be a V.35 port operating at fixed rate of 2.048 Mbps or an Ethernet port operating at up to 100 Mbps
- One or two uplink interface boards (A and B)
- One or two power supplies (A and B):  
AC/DC wide-range power supply (100-240 VAC or -40 to -72 VDC)

### Fiber Optic Uplink Interface

The fiber optic interface provides a secure link in hazardous or hostile environments, increasing the maximum connection range, and achieving immunity against electrical interference and protection against the harmful effects of ground loops. To optimally meet a wide range of system requirements, the fiber optic interface can be ordered for operation over 62.5/125 micron multimode fibers (typical attenuation 3.5 dB/km at 850 nm), as well as over low-loss 9/125 micron single mode fibers (typical attenuation 0.4 dB/km at 1310 nm, and 0.25 dB/km at 1550 nm).

The fiber optic interface is hot swappable, allowing for quick and easy replacement in the field.

### Technical Characteristics

*Table 1-1* provides information on the characteristics of the optical subsystem, including the maximum range over typical fiber optic cable. The maximum range values given in the table below assume a margin of 3 dB.

*Table 1-1 Fiber Optic Interface Characteristics*

Wavelength	Fiber Type	Transmitter Type	Typical Output Power	Receiver Sensitivity	Typical Max. Range	Connector Type
[nm]	[μm]		[dBm]	[dBm]	[km miles]	
850	62.5/125 multimode	Laser (VCSEL)	-6	-34*	4.5 2.8	ST, SC, FC/PC
1310	9/125 single mode	Laser	-12	-34	47 29.2	ST, SC, FC/PC
1310	62.5/125 multimode	LED	-18	-32	7 4.3	ST, SC
1310	9/125 single mode	Laser [long haul]	-2	-34	72 44.7	ST, SC, FC/PC
1310 Transmit/Receive	9/125 single mode Single fiber	Laser [SF3]	-12	-27	20 12.4	SC/APC only
1310/1550 Transmit/Receive	9/125 single mode Single fiber	Laser WDM [SF1]	-12	-34	47 29.2	SC

1550/1310 Transmit/Receive	9/125 single mode Single fiber	Laser WDM [SF2]	-12	-34	47	29.2 SC
1550	9/125 single mode	Laser	-12	-34	76 47.2	ST, SC, FC/PC
1550	9/125 single mode	Laser [long haul]	-2	-34	120 74.5	ST, SC, FC/PC

\* The Receiver Sensitivity for units with the Ethernet port is 32 dBm.

All fiber optic interface options offer high performance and have a wide dynamic range.

### Note

*The SF3 option uses an SC/APC connector. The FO cable connected to it must therefore be of the same type.*

## Uplink Redundancy Option

Optimux-108 can be ordered with one or two link interface options. Each interface operates independently, and can be ordered from the link options listed above.

In the uplink redundancy option, Optimux-108 supports fully automatic switching between the main and the backup link. The main link has priority, therefore normally it is selected for use, and the backup link is disabled. In case a failure occurs on the main link, Optimux-108 automatically switches to the backup link and continues providing normal service. After the main link returns to normal operation, it is automatically reselected.

Each link interface has its own set of indicators that display the current state of the link.

## E1 Tributary Interface

The Optimux-108 tributary interfaces meet the requirements of ITU-T Rec. G.703. The tributary ports (1-4) can be one of the following:

- 120Ω balanced line interface, terminated in a RJ-45 8-pin connector
- 75Ω unbalanced interface, terminated in two BNC coaxial connectors.

Line coding is HDB3. The nominal balanced interface transmit level is  $\pm 3V$ , and the unbalanced interface transmit level is  $\pm 2.37V$ . The maximum line attenuation is up to 6 dB, and each E1 signal is processed by an adaptive equalizer that compensates for various cable lengths to ensure optimal performance. Phase locked loops (PLL) are used to recover the clock signals, and the resulting jitter performance complies with the requirements of ITU-T Rec. G.823.

Each tributary interface has its own set of indicators that show the current state of the tributary link. The user can disable the alarm indications generated by unused interfaces. AIS data streams are transmitted instead of failed or unconnected tributary data streams.

## V.35 User Port

Optimux-108 can be also ordered with an additional V.35 user port. This port has a V.35 DCE interface supporting both ISO 2110 and Telebras pinouts on DB-25 connectors and M34 connector pinout. All these pinouts are supported via external cables.

## Ethernet User Port

Optimux-108 can be also ordered with an additional Ethernet user port. This port operates at a rate of 10/100 Mbps and can be set to 10/100 full or half duplex, autonegotiation enable/disable. It supports flow control enable/disable option and MDI/MDIX connection.

## Timing

The uplink interface supports only internal timing mode.

The clock of each E1 channel is independent for each channel and transferred transparently.

The V.35 interface supports internal, external, and loopback timing modes.

The figures below describe the three clock modes supported by the V.35 interface.

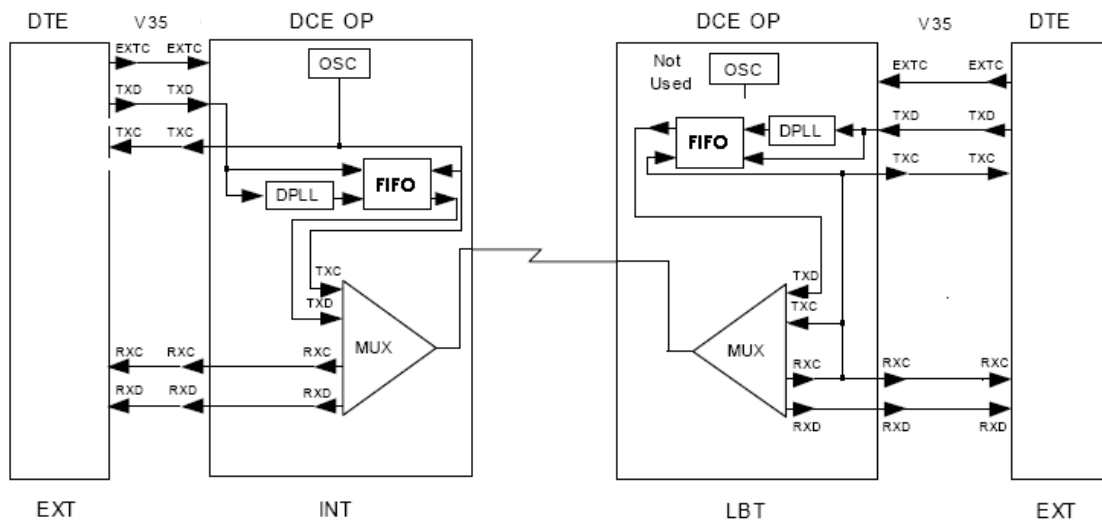


Figure 1-4. Internal and Loopback Timing

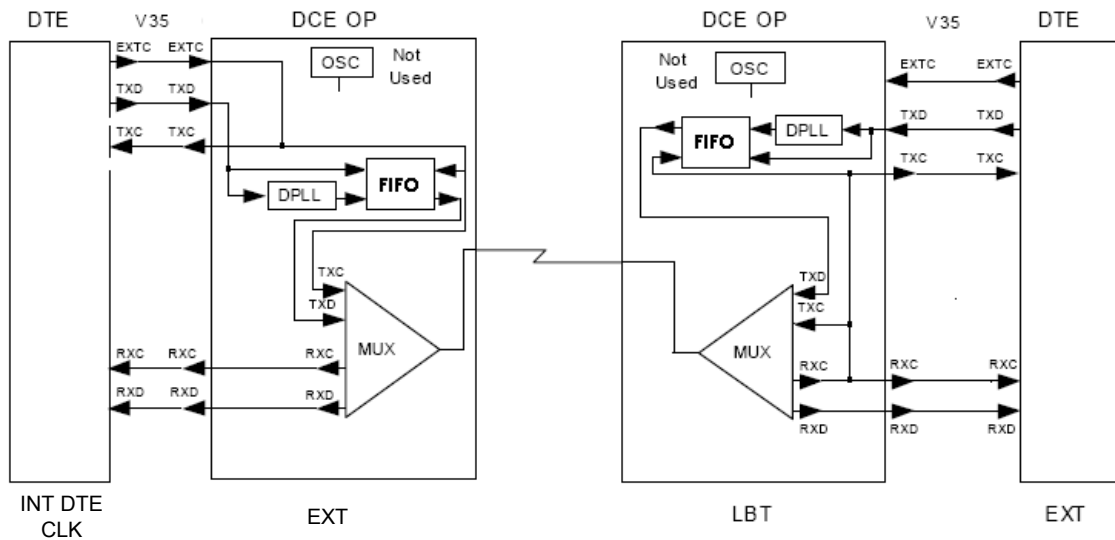


Figure 1-5. External and Loopback Timing

## Test and Diagnostics Capabilities

Optimux-108 has comprehensive test and diagnostics capabilities that include local and remote loopbacks on the uplink interface and on each E1 tributary link. A local loopback is also supported on the optional V.35 user port.

Maintenance is further enhanced by an automatically performed self-test on power up.

For activation of loopbacks, see [Chapter 5](#).

## Alarms and Alarm Indications

### Uplink and Tributaries

Optimux-108 detects the following alarm conditions on each E1 and uplink interface:

- Loss of input signal
- Loss of frame synchronization (on uplink only)
- Reception of alarm indication (AIS) signal, which consists of a continuous sequence of '1's (on the tributary only)

When not all the tributaries are in use, you can disable the alarm indications related to the unused tributaries through the software, see [Chapter 5](#).

### V.35 User Port

On the V.35 interface, Optimux-108 detects the Missing DTR signal (relevant only for ISO 2110 pinout).

**Note** This alarm should be masked when using Telebras and M34 cable (see [Chapter 6](#)).

## Response to Alarm Conditions

AIS is transmitted on each tributary output in the following cases:

- Loss of uplink input signal is detected
- Uplink frame synchronization is lost.

An AIS signal is sent on a tributary instead of the tributary data stream through the uplink in the following cases:

- Loss of tributary input signal is detected
- AIS is received on the tributary input
- Local Loop Back is activated on the E1 input.

## Rear Panel Alarm Connector

An optional dedicated rear panel connector is used to provide major and minor alarm indications, by means of dry contacts.

The **major** alarm is activated in the following cases:

- Optimux-108 is not powered, or total power supply failure (e.g., when two power supplies are installed, failure of both supplies)
- One of two power supplies is faulty (optional, in case both power supplies are installed)
- Loss of uplink input signals, or loss of uplink frame synchronization
- Signal loss at backup link while Link Redundancy mode is Automatic/Manual
- Loss of tributary input signals
- Redundancy mode is Automatic/Manual, but backup link is not installed
- Unable to activate redundancy
- MNG-ETH link failed
- Missing DTR signal (relevant only for ISO 2110, masked for Telebras).
- Connection with the remote device is lost.

The **minor** alarm is activated in the following case:

- Reception of AIS signal on tributary inputs.

## Events

Optimux-108 supports the following events, which are shown in the Event Log:

- Failure in processing software download
- Event log buffer has exceeded the maximum size and new events are written over the old ones
- Login was performed to the unit
- Trying to log into the unit with wrong user name or password
- Read/write via SNMP with wrong community
- Unit is powered up
- Uplink is switched from A to B and vice versa.



## Management

Optimux-108 can be configured and monitored locally via an ASCII terminal, or remotely via Telnet, Web-based remote access terminal (ConfiguRAD) or RADview-TDM running in a Windows or Unix environment.

## Power

The power supply is a wide-range AC/DC power supply that can be connected to either an AC power source (100 to 240 VAC), or to a DC power source (–48 VDC).

Optimux-108 can be ordered with one or two power supplies. When two power supplies are installed, they share the load. If one of the power supplies fails or its input power is disconnected, the other one continues providing power to the unit.

---



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## 1.4 Technical Specifications

Uplink Interface	<i>Number of Links</i>	One or two (A and B)
	<i>Type</i>	Fiber Optic
	<i>Performance</i>	Refer to <a href="#">Table 1-1</a>
	<i>Connectors</i>	ST, SC, FC/PC, or SC/PC, ordered option (SF1/SF2 options only available with SC) (SF3 option only available with SC/APC)
E1 Tributary Interface	<i>Applicable Standards</i>	ITU-T Rec. G.703, G.823
	<i>Nominal Line Data Rate</i>	2048 kbps
	<i>Line Code</i>	HDB3
	<i>Bit Rate Tolerance</i>	±25 ppm
	<i>Line Impedance</i>	120Ω (balanced) or 75Ω (unbalanced)
	<i>Connectors</i>	Balanced interface: Shielded RJ-45 connector Unbalanced interface: two BNC coaxial connectors
	<i>Signal Levels</i>	
	<i>Transmit level</i>	
	<i>Balanced Interface</i>	±3V ±10%
	<i>Unbalanced Interface</i>	±2.37V ±10%

	<i>Receive level</i>	0 to -6 dB
	<i>Jitter performance</i>	Per ITU-T Rec. G.823
<b>V.35 Interface</b>	<i>Data Rate</i>	2.048 Mbps
	<i>Timing</i>	Internal, External and Loopback Timing
	<i>Connector</i>	Smart Serial
	<i>Control Signals</i>	RTS, CTS, DTR, DSR, and DCD
<b>USER-ETH Port</b>	<i>Physical Interface</i>	10/100BaseT
	<i>Data Rate</i>	10/100 Mbps
	<i>Transmission Rate</i>	Full/Half Duplex
	<i>Transmission Mode</i>	<ul style="list-style-type: none"> <li>• Full/half-duplex</li> <li>• Auto-negotiation enable/disable</li> <li>• Flow Control and Backpressure enable/disable</li> </ul>
	<i>Connector</i>	Shielded RJ-45
<b>Control Port</b>	<i>Physical Interface</i>	RS-232 DCE Asynchronous
	<i>Data Rate</i>	9.6, 19.2, 38.4, 57.6, 115.2 kbps
	<i>Connector</i>	Mini-USB 5
<b>MNG-ETH Port</b>	<i>Physical Interface</i>	10/100BaseT
	<i>Data Rate</i>	10/100 Mbps
	<i>Transmission Rate</i>	Full/Half Duplex
	<i>Transmission Mode</i>	<ul style="list-style-type: none"> <li>• Full/half-duplex</li> <li>• Auto-negotiation enable/disable</li> <li>• Flow Control and Backpressure enable/disable</li> </ul>
	<i>Connector</i>	Shielded RJ-45
<b>Timing</b>	<i>Uplink</i>	Internal
	<i>E1 Tributary Channels</i>	Transferred transparently, independent for each channel
	<i>V.35 Port</i>	<ul style="list-style-type: none"> <li>• Internal</li> <li>• External</li> <li>• Loopback</li> </ul>

<b>Diagnostics</b>		Local and remote loopbacks on uplink and on each E1 tributary link
		Local loopback on optional V.35 user port
<b>Indicators</b>	<i>Front Panel</i>	
	<i>PWR</i>	On (green): both power supplies OK On (red): power supply A fault On (yellow): power supply B fault Off: power supply fault
	<i>LINK A/B</i>	On (red): Sync/Signal Loss on Link A/B On (yellow): not used Off: normal operation
	<i>CH1 to CH4</i>	On (red): Signal Loss on channel On (yellow): AIS received on channel Off: normal operation
	<i>Rear Panel</i>	
	<i>Sig Link A/B (on the fiber optic module)</i>	On (green): signal exists on Link A/B Off: no signal on Link A/B
	<i>LINK/ACT</i>	On (yellow): link is up Off: link is down Blinks: frames are transmitted
<b>Alarm Relay</b>	<i>100</i>	On (green): 100 Mbps mode Off: 10 Mbps mode
	<i>Connector</i>	Shielded RJ-45
	<i>Contact Functions</i>	Set of floating normally-closed/normally open contacts for major and minor alarm indication
	<i>Contact Rating</i>	Maximum 0.5A (at 30 VDC or 30 VAC) through closed contacts
<b>Power</b>	<i>Wide range AC/DC Power Supply</i>	100 to 240 VAC, 50 or 60 Hz, 25 VA -48/60 VDC (-40 to -72 VDC), 9W
<b>Physical</b>	<i>Plastic Enclosure</i>	
	<i>Height</i>	4.37 cm / 1.7 in (1U)
	<i>Width</i>	21.7 cm / 8.5 in
	<i>Depth</i>	17.0 cm / 6.7 in
	<i>Weight</i>	0.5 kg / 1.1 lb

***Metal Enclosure***

*Height* 4.73 cm (1.8 in)

*Width* 21.5 cm (8.4 in)

*Depth* 15.25 cm (6.0 in)

*Weight* 0.7 kg (1.5 lb)

**Environment**

*Operating Temperature* 0° to 50°C (32° to 122°F)

*Relative Humidity* Up to 90%, non-condensing

# Chapter 2

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## Installation and Setup

This chapter describes installation and setup procedures for the Optimux-108 unit.

After installing the unit, refer to [Chapter 3](#) for the operating instructions. If a problem is encountered, refer to [Chapter 5](#) for test and diagnostic instructions.



Internal settings, adjustment, maintenance, and repairs may be performed only by a skilled technician who is aware of the hazards involved.

Always observe standard safety precautions during installation, operation, and maintenance of this product.

---

**Note**

*Before installing the product, review [Handling Energized Products](#) at the beginning of the manual.*

---

---

### 2.1 Site Requirements and Prerequisites

The Optimux-108 device is intended for installation on desktop or 19" racks. The RM-33-2 mounting kit is available from RAD for mounting 1 or 2 units in a 19" rack. For metal enclosure units RM-35 or WM-35 rack mount kits are available.

Allow at least 90 cm (36 in) of frontal clearance for operating and maintenance accessibility. Allow at least 10 cm (4 in) clearance at the rear of the unit for signal lines and interface cables.

Avoid sharp bends when planning the routing of fiber optic cables.

The ambient operating temperature of Optimux-108 is 0 to 50°C (32 to 122°F), at a relative humidity of up to 90%, non-condensing.

AC-powered Optimux-108 units should be installed within 1.5m (5 ft) of an easily-accessible grounded AC outlet capable of furnishing the voltage in accordance with Optimux-108 nominal supply voltage.

DC-powered Optimux-108 units require a -48 VDC power source, which must be adequately isolated from the main supply.

**Note**

*Refer also to the sections describing connections of AC and DC mains at the beginning of the manual.*

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## 2.2 Package Contents

The Optimux-108 package contains the following items:

- One Optimux-108 unit
- AC power cable (two cables when ordered with redundant power supply)
- DC adapter plug (two plugs when ordered with redundant power supply))
- Technical Documentation CD
- Control port cable: CBL-MUSB-DB9F
- Alarm port cable: CBL-RJ45-DB9/F
- V.35 interface cable (if V.35 interface is ordered):
  - CBL-AMP-M34 - Smart Serial to M34 interface
  - CBL-AMP-DB25-ISO2110 - Smart Serial to ISO 2110 interface
  - CBL-AMP-DB25-TLBS - Smart Serial to Telebras interface
- RM-33-2 rack-mount kit (if ordered)
- RM-35 or WM-35 rack mount kits for the metal enclosure unit (if ordered).

---

## 2.3 Required Equipment

The following equipment is required to install Optimux-108:

- Fiber optic cables (for optical uplink interface)
- RJ-45 E1 connector cables (for balanced tributary interface)
- RJ-45 Ethernet connector cable category 5
- Philips screwdriver (for installation in 19-inch rack).

---

## 2.4 Mounting the Unit

Optimux-108 is designed for installation as a desktop unit. It can also be mounted in a 19" rack. For rack mounting instructions, refer to the RM-33-2 installation kit manual that comes with the RM kit for plastic enclosure unit and RM-35 or WM-35 rack mount kits for the metal enclosure unit.

If Optimux-108 is to be used as a desktop unit, place and secure the unit on a stable, non-movable surface.

Refer to the clearance and temperature requirements in [Site Requirements and Prerequisites](#).

---

## 2.5 Connecting the Interfaces

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Eye damage may be caused by a broken or unterminated fiber optic or connector if the laser beam is viewed directly or with improper optical instruments. The laser beam is invisible.

---



Access to the inside of the equipment is permitted only to qualified and authorized service personnel.

Disconnect the unit from the power line and from all the cables before removing cover.

---



Dangerous high voltages are present inside the Optimux-108 when it is connected to power and/or to the links. Moreover, under external fault conditions, dangerous high voltages may appear on the lines connected to the Optimux-108.

Any adjustment, maintenance, and repair of the opened instrument under voltage should be avoided as much as possible and, when inevitable, would be carried out only by a skilled technician who is aware of the hazard involved. Capacitors inside the instrument may still be charged even after the instrument has been disconnected from its source of supply.

---

### **Caution**

Optimux-108 contains components sensitive to electrostatic discharge (ESD). To prevent ESD damage, avoid touching the internal components.

---



Optimux-108 includes Class 1 lasers. For your safety:

- Do not look directly into the optical connectors while the unit is operating. The laser beams are invisible.
- Do not attempt to adjust the laser drive current.

The use of optical instruments with this product will increase eye hazard. Laser power up to 1 mW at 1300 nm and 1550 nm could be collected by an optical instrument.

Use of controls or performing procedures other than those specified herein may result in hazardous radiation exposure.

---

## Connector Location

The following figures show two typical Optimux-108 plastic rear panels and identify the connector locations. *Figure 2-1* and *Figure 2-2* show the unit with the V.35 user port and, respectively, balanced and unbalanced tributaries. *Figure 2-3* and *Figure 2-4* show the unit with the Ethernet user port and, respectively, balanced and unbalanced tributaries. *Figure 2-5* to *Figure 2-8* show a typical rear panels of the metal enclosure unit.

For connector pinout, see *Appendix A*.

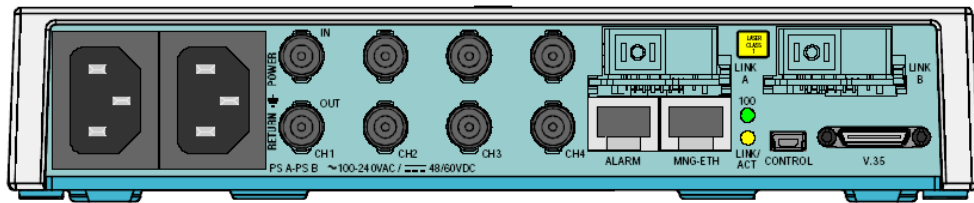


Figure 2-1 Plastic Enclosure, V.35 User Port and Unbalanced E1 Tributaries

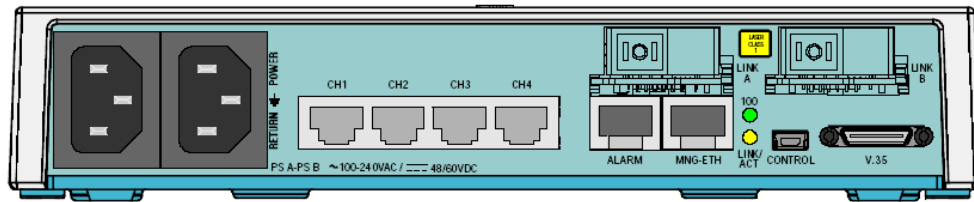


Figure 2-2. Plastic Enclosure, V.35 User Port and Balanced E1 Tributaries

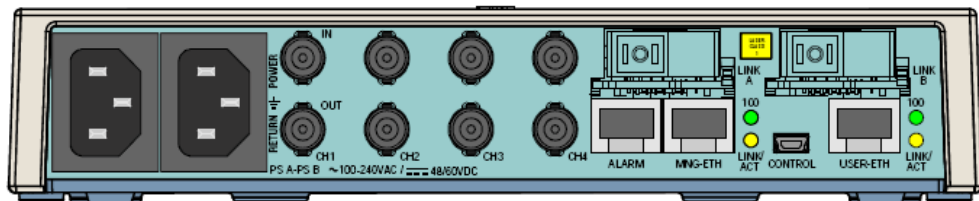


Figure 2-3 Plastic Enclosure, Ethernet User Port and Unbalanced E1 Tributaries

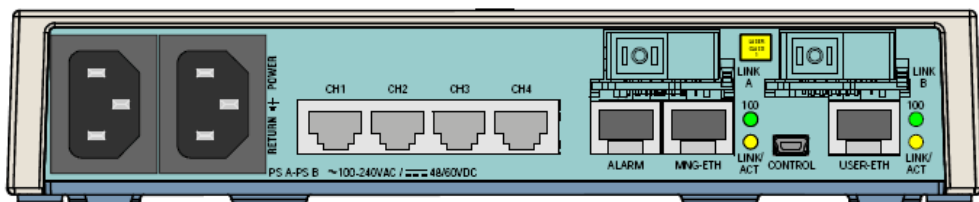


Figure 2-4. Plastic Enclosure, Ethernet User Port and Balanced E1 Tributaries

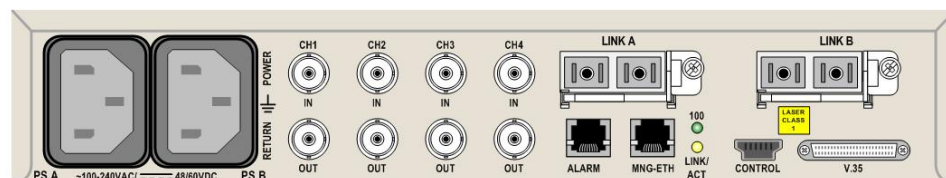


Figure 2-5 Metal Enclosure, V.35 User Port and Unbalanced E1 Tributaries

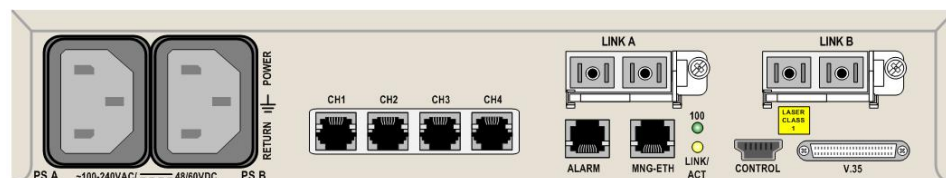


Figure 2-6. Metal Enclosure, V.35 User Port and Balanced E1 Tributaries



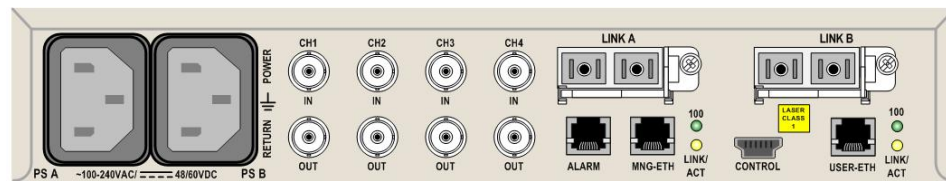


Figure 2-7 Metal Enclosure, Ethernet User Port and Unbalanced E1 Tributaries

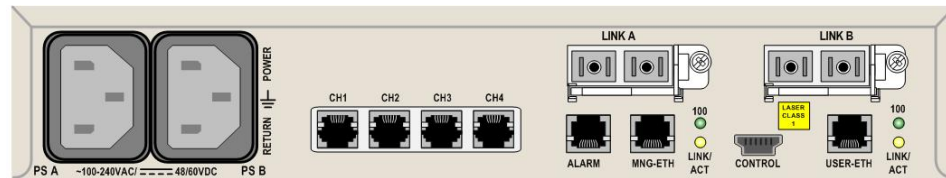


Figure 2-8. Metal Enclosure, Ethernet User Port and Balanced E1 Tributaries

## Connecting the Uplink

Each fiber optic uplink interface is terminated in two ST, SC, FC-PC, or SC/APC connectors, in accordance with the customer's order.

For each uplink interface (A and B), connect as follows:

### ► To connect the uplink:

1. Clean the optical connectors using an approved solvent, and dry thoroughly using optical tissue.
2. Connect the cables to the two optical connectors designated TX (transmit output) and RX (receive input) of the appropriate interface.
3. Note the correct connection of the transmit and receive cables to the corresponding connectors. Avoid sharp bends and twisting of the fiber-optic cables.

### Notes

- Pay attention that SF1 must work opposite SF2 and not opposite the same type of link.
- For WDM option, only one fiber optic cable per link should be connected.

## Connecting the Tributary Interface

The tributary interface has four RJ-45 connectors (for the balanced link interface) or four dual BNC connectors (for the unbalanced interface). For pin allocation of the RJ-45 connectors, see [Appendix A](#).

### ► To connect the tributary interface:

- Connect each of the tributary cables to the connector(s) of the corresponding to the interface.
  - For the balanced interfaces, connect to the RJ-45 connectors designated CH1, CH2, CH3, or CH4, respectively.
  - For the unbalanced interface, connect the cables to the two BNC connectors designated IN (transmit input) and OUT (receive output) of the appropriate interface. Note correct connection of the transmit and receive cables to the IN and OUT connectors.

## Connecting the V.35 Interface

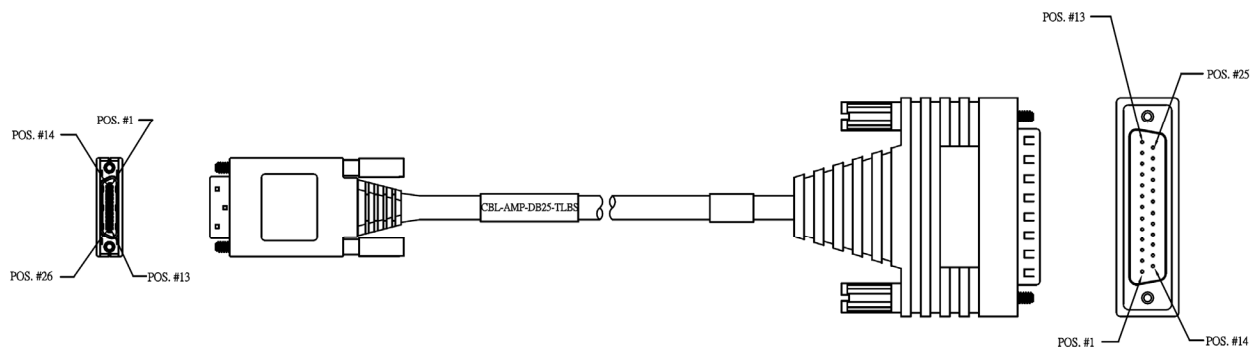
The Optimux-108 V.35 interface terminates in a 26-pin smart serial connector. The pin assignment for the V.35 Interface connector (Smart serial) is given in [Appendix A](#).

► **To connect the V.35 Port:**

- Connect the DTE to the V.35 port using the required interface cable according to the application: ISO 2110, Telebras or M34.

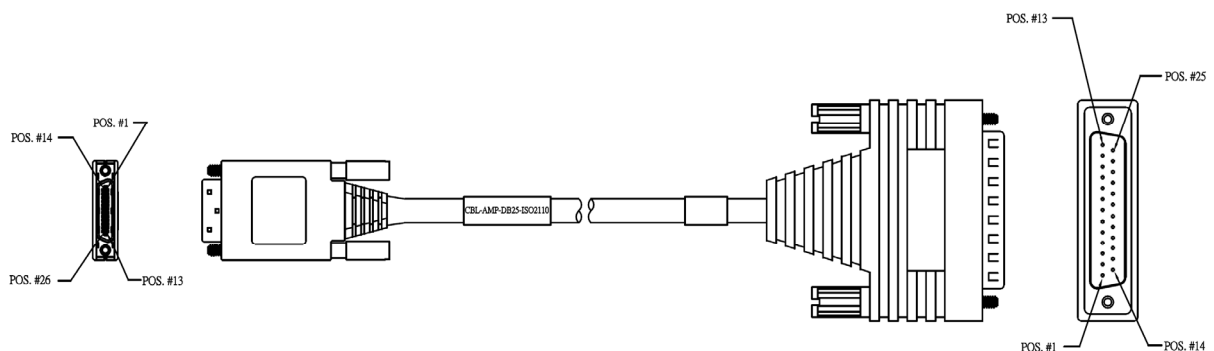
The following interface cables can be ordered from RAD.

[Figure 2-9](#) shows the **CBL-AMP-DB25-TLBS** interface cable designed to connect the Optimux-108 Smart serial interface connector to the user equipment DB-25 connector with Telebras pinout.



*Figure 2-9. CBL-AMP-DB25-TLBS Cable*

[Figure 2-10](#) shows the **CBL-AMP-DB25-ISO2110** interface cable designed to connect the Optimux-108 Smart serial interface connector to the user equipment DB25 connector with ISO 2110 pinout.



*Figure 2-10. CBL-AMP-DB25-ISO2110 Cable*

[Figure 2-11](#) shows the **CBL-AMP-M34** interface cable designed to connect the Optimux-108 Smart serial interface connector to the M34 connector of the user equipment.

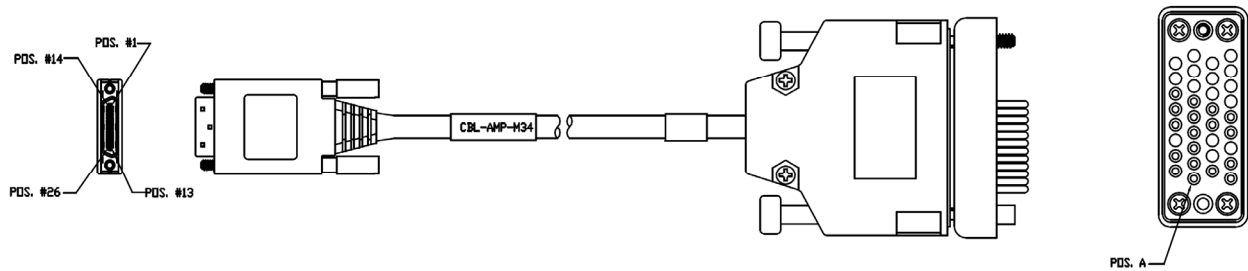


Figure 2-11. CBL-AMP-M34 Cable

## Connecting the User Ethernet Port

The user Ethernet port interface terminates in an 8-pin RJ-45 connector.

### ► To connect the User Ethernet Port:

- Connect the Ethernet user equipment to the MNG-ETH connector using a UTP-CAT5 cable.

## Alarm Connector

This connector connects the changeover contacts of the major (optionally, minor) alarm relays to the external equipment. Connection of the alarm port is made using a special cable with RJ-45 connector and DB9-female connector – CBL-RJ45-DB9/F, shown in [Figure 2-12](#).

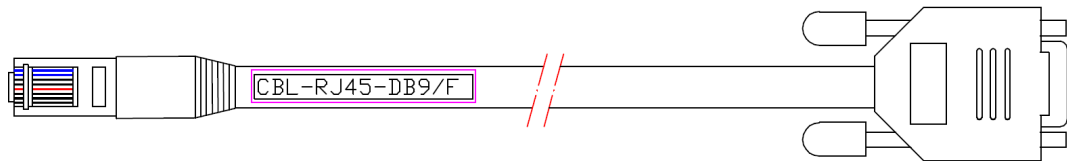


Figure 2-12. Alarm Cable - CBL-RJ45-DB9/F

### ► To connect the alarm connector to the external equipment:

1. Connect the RJ-45 connector of the CBL-RJ45-DB9/F cable to the ALARM connector located on the Optimux-108 rear panel.
2. Connect the external DB9-female connector of the CBL-RJ45-DB9/F cable to the external equipment.

## Connecting the Ethernet Management Port

The Ethernet Management Port interface terminates in an 8-pin RJ-45 connector.

### ► To connect the Ethernet Management port:

- Connect the management station to the MNG-ETH connector using a UTP-CAT5 cable.

## Connecting the Control Port

The optional Optimux-108 supervisory port has a standard RS-232 DCE interface. RAD supplies a special control cable, CBL-MUSB-DB9F (see [Figure 2-13](#)), for connection of this mini USB connector to the supervision terminal.

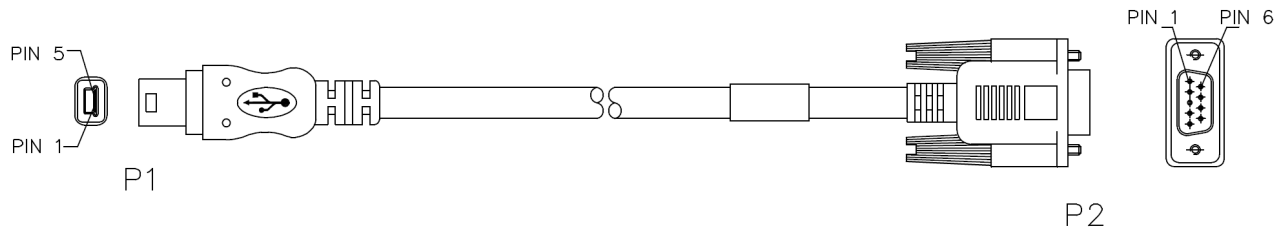


Figure 2-13. Control Cable

► To connect the control port:

- Connect the control cable to the mini USB connector at the rear panel and to the DCE device, using the CBL-MUSB-DB9F control cable.

---

## 2.6 Connecting to Power

Optimux-108 accepts either 110–240 VAC or -48/-60 VDC power through the same power inlet.



**Warning**

Before connecting or disconnecting any cable, the protective earth terminals of this unit must be connected to the protective ground conductor of the mains (AC or DC) power cord. If you are using an extension cord (power cable) make sure it is grounded as well.

Any interruption of the protective (grounding) conductor (inside or outside the instrument) or disconnecting of the protective earth terminal can make this unit dangerous. Intentional interruption is prohibited.

**Note**

Refer also to the sections describing connections of AC and DC power at the beginning of the manual.

## Connecting to AC Power

AC power should be supplied via a 1.5m (5 ft) standard power cable terminated by a standard 3-prong socket. A cable is provided with the unit.

► To connect AC power:

1. Connect the power cable to the connector on the Optimux-108 rear panel.
2. Connect the power cable to the electricity outlet.
3. In the case of the redundant power supply, repeat the procedure.

The unit turns on automatically upon connection to the mains.

## Connecting to DC Power

A special IEC 60320 adapter for the -48/-60 VDC power connection is supplied with the unit.

➤ **To connect DC power:**

- Refer to the DC power supply connection supplement for instructions how to wire the DC adapters. The DC supplement is provided on the technical documentation CD supplied with the unit.

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**Caution**

The DC installation procedure must be performed by a qualified technician.

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# Chapter 3

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## Operation

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### 3.1 Turning On the Unit

- To turn on an Optimux-108 unit with a single power supply:
  1. Connect the power cable to the power connector on the rear panel of the Optimux-108.
  2. Connect the power cable to the electric outlet.

The PWR indicator lights in green.

- To turn on an Optimux-108 unit with two power supply units:
  1. Connect each power cable to a power connector on the Optimux-108 rear panel.
  2. Connect each power cable to the electricity outlet.

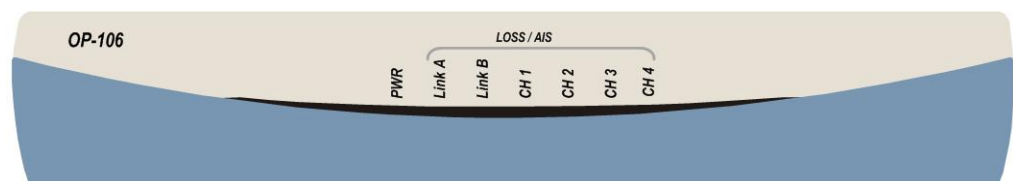
The PWR indicator lights in green.

---

### 3.2 Indicators

#### Front Panel Indicators

*Figure 3-1* shows the Optimux-108 front panel. *Table 3-1* lists the functions of the front panel indicators.



*Figure 3-1 Optimux-108 Front Panel*

*Table 3-1. Optimux-108 Indicators*

LED Function	Color	Meaning
PWR	Green	Power supplies A and B are functioning correctly or PSA is good and PSB is not installed or PSB is good and PSA is not installed
	Red	PSA exists but is faulty

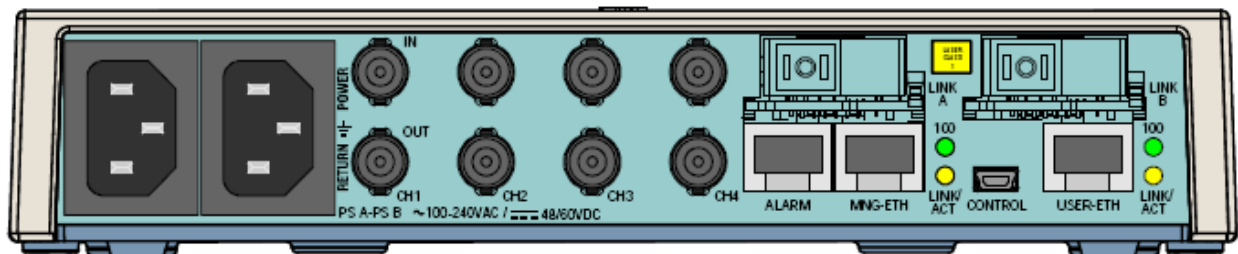
LED Function	Color	Meaning
	Yellow	PSB exists but is faulty
	Off	Power is Off
Link A	Red	Signal loss or sync. loss detected
	Off	Normal operation – no alarm is detected, or power is Off
Link B	Red	Signal loss or sync. loss detected
	Off	Normal operation – no alarm is detected, or power is Off
CH1	Yellow	AIS detected on E1 Ch1
	Red	Signal loss detected on E1 CH1
	Off	Normal operation – no alarm is detected, or power is Off
CH2	Yellow	AIS detected on E1 Ch2
	Red	Signal loss detected on E1 CH2
	Off	Normal operation – no alarm is detected, or power is Off
CH3	Yellow	AIS detected on E1 Ch3
	Red	Signal loss detected on E1 CH3
	Off	Normal operation – no alarm is detected, or power is Off
CH4	Yellow	AIS detected on E1 Ch4
	Red	Signal loss detected on E1 CH4
	Off	Normal operation – no alarm is detected, or power is Off

During normal operation:

- The PWR indicator lights in green.
- The indicator corresponding to the uplink in use, A or B, lights.
- All SYNC LOSS front-panel indicators are turned off.

## Rear Panel Indicators

*Figure 3-2* shows the rear panel of an Optimux-108 model with the user Ethernet port. *Table 3-1* lists the functions of the rear panel indicators.



*Figure 3-2. Optimux-108 Rear Panel*



*Table 3-2. Optimux-108 Rear Panel Indicators*

LED Function	Color	Meaning
<b>USER ETH: LINK/ACT</b>	Yellow	On - USER link is up
	Blinking yellow	USER link is up and Rx and/or Tx frames are being transmitted
	Yellow	Off - Management link is down
USER ETH: 100	Green	On - 100M mode
		Off - 10M mode
MNG ETH: LINK/ACT	Yellow	On - Management link is up
	Blinking yellow	Management link is up and Rx and/or Tx frames are being transmitted
	Yellow	Off - Management link is down
MNG. ETH: 100	Green	On - 100M mode
		Off - 10M mode
SIG (located on the bottom of the fiber optic module)	Green	On - Signal is detected on fiber optic module
		Off - signal not detected

### 3.3 Default Settings

*Table 3-3* lists the default settings of the Optimux-108 configuration parameters.

*Table 3-3. Default Settings*

Type	Parameter	Default Value
<b>System</b>		
<i>Device Information</i>	Name	Optimux-108
	Location	The Location of the Device
	Contact Person	Name of Contact Person
<i>Host</i>	IP address	0.0.0.0
	IP mask	0.0.0.0
	Default gateway	0.0.0.0
	Read Community	public
	Write Community	private
	Trap Community	public
<i>Management Access</i>	Telnet	All
	SNMP	All
	Web	All

Type	Parameter	Default Value
<i>Control Port</i>	Baud rate	115200
	Security timeout	10
	Pop alarms	Off
		Off
	Device	Local
	Alarms	Unmasked
	Remote Connection Fall	Unmasked
	Force Link	Link A
	Mode	Auto
Physical Layer		
<i>Ethernet</i>	Device Number	Local
	Port Number	MNG-ETH
	Port Name	-
	Auto Negotiation	Enable
	Flow Control	Disable
	Alarms	Unmasked
<i>V.35</i>	Device Number	Local
	Administrative Status	Up
	Port Name	-
	Clock Source	Internal
	DCD Status	Permanent ON
	CTS Status	Permanent ON
	DTE Loop Detection	Disable
	Alarms	Unmasked
<i>Link</i>	Device Number	Local
	Port Number	Link A
	Port Name	-
	Alarms	Unmasked
<i>E1</i>	Device Number	Local
	Port Number	1
	Port Name	-
	Alarms	Unmasked
<i>Diagnostics</i>	Device Number	Local
	Link Loop type	No Loop

Type	Parameter	Default Value
	Link LLB loop timeout (min) [1-255]	5
	Channel's Loops	No Loop

---

## 3.4 Configuration and Management Alternatives

After installation, there are no special operating procedures for Optimux-108. Once it is powered up, the unit operates automatically. The unit operational status can be monitored constantly.

If required, Optimux-108 can be reconfigured. Optimux-108 can be managed using different ports and applications:

- Local out-of-band management via an ASCII terminal connected to the RS-232 port. Usually, preliminary configuration of the system parameters is performed via ASCII terminal. Once the Optimux-108 host IP parameters are set, it is possible to access it via Telnet, ConfiguRAD or RADview for further configuration.
- Remote management via Ethernet management port. Remote management is performed using Telnet, or ConfiguRAD (RAD's Web-based application), or RADview-PC/TDM and RADview-HPOV/TDM (RAD's SNMP-based management systems). Alternatively, Optimux-108 can be managed via a third-party SNMP-based NMS.

Optimux-108 allows up to three management sessions to be active at a time. This includes up to two network sessions (Telnet or ConfiguRAD) and one ASCII terminal session. When connected via Telnet or Web, the user is disconnected after 10 minutes of inactivity (no keyboard input on the client computer).

The following functions are supported by the Optimux-108 management software:

- Viewing system information (Inventory)
- Modifying configuration and mode of operation, including setting system default values and resetting the unit
- Monitoring Optimux-108 performance
- Initiating loopback tests (Diagnostic)
- Uploading and downloading software and configuration files.

## Working with Terminal

Optimux-108 has a V.24/RS-232 asynchronous DCE port, designated CONTROL and terminated in a 9-pin D-type female connector. The control port continuously monitors the incoming data stream and immediately responds to any input string received through this port.

The Optimux-108 control port can be configured to communicate at the following rates: 9.6, 19.2, 38.4, 57.6 or 115.2 kbps.

► **To start a terminal control session:**

1. Make sure all Optimux-108 cables and connectors are properly connected.
2. Connect Optimux-108 to a PC equipped with an ASCII terminal emulation application (for example, Windows Hyper Terminal or Procomm).
3. Turn on the control terminal PC and set its port parameters to 115,200 baud, 8 bits/character, 1 stop bit, no parity, flow control: none.
4. Set the terminal emulator to VT100 emulation (for optimal view of system menus).
5. If you are using Hyper Terminal, set the terminal application under windows system to 132-column mode for optimal view of system menus (**Properties > Settings > Terminal Setup > 132 column mode**).
6. When the initialization and self-test are over, press any key to display the user name and password entry fields.

## Login

To prevent unauthorized modification of the operating parameters, Optimux-108 supports two access levels:

- **Superuser** can perform all the activities supported by the Optimux-108 management facility, including defining new users.
  - **User's** access rights (**full control** or **read only**) are defined by the superuser. Users are not allowed to create new users.
1. After the SW finishes uploading, press **Enter** a few times.  
"..." appears.
  2. Press <.> a few times until the following Password Prompt screen appears.  
(This synchronizes the baud rate of the terminal to the setup configuration).

Optimux-108	
USER NAME:	SU
PASSWORD:	****
ESC - clear; & - exit;	
0 M/ 1 C	

Figure 3-3. Password Prompt Screen

**Note** *It is recommended to change default passwords to prevent unauthorized access to the unit.*

► **To enter as a superuser:**

1. Enter **su** for user name.
2. Enter **1234** for password.

This allows you to configure all the parameters of Optimux-108, and to change the **su** and **user** passwords.

- **To enter as a user:**
  1. Enter **user** for user name.
  2. Enter **1234** for password.
- **To set all passwords to the default values (1234):**
  - Log in as **su** and delete the unit's configuration through the configuration screens.

## Choosing Options

- **How to use the terminal to perform a desired activity:**
  - To select a menu item, type the corresponding line number and then press **<Enter>**. This will either ...
    - ... display a submenu or a parameter selection screen ...
      - or ...
    - ... let you type the (free text) parameter value in the same row
      - or ...
    - ... toggle the current value of the corresponding parameter (relevant to **ENABLE/DISABLE** or **ON/OFF** selections).
  - The type of response to be expected after selecting a menu item is indicated as follows:
 

>	Selecting that item will display a submenu or a parameter selection screen.
...	Selecting that item will let you type the desired value in the same line.
<b>Nothing</b>	When neither symbol is displayed, selecting that item will toggle the current selection, now shown in brackets (for example, this will change <b>ENABLE</b> to <b>DISABLE</b> or vice versa).

## Navigating the Screens

- The following hot keys are provided for navigating the screens:
  - **Esc** – Return to previous menu
  - **!** – Return to the main menu
  - **⌘** – Exit to password screen (to prevent unauthorized access after completing the session)
- When a menu does not fit on one screen (because it includes many lines), it is displayed on two consecutive pages. In this case:
  - Press **D** to browse forward (down)
  - Press **U** to browse backward (up).
- When a configuration screen is organized as a table, a special set of keys is used for navigation within the table (such screens always have a **?** (help)

option that displays these keys). The following keys may be used for navigation within tables:

**L** – move to the left

**R** – move to the right

In addition, the following shortcuts are also available:

- **Tab** – select the next cell that may be changed
- **S** followed by **<row number>**, **<col number>** – select a specific cell. For example, type **S2,5** to select the fifth cell in the second row.
- The current value of a parameter is listed within parentheses ( ). To change a parameter value on a parameter selection screen:
  - Type the line number corresponding to the desired value, and then press **<Enter>**
  - To enter a value which requires free text entry, type in the desired string and then press **<Enter>**. Use backspace to erase the current string.

Note that whenever applicable, the allowed range of values of a parameter is listed within square brackets [ ].
- The entry is checked after pressing **<Enter>**, and it is accepted only if it is valid:
  - If you make an error, for example, if you press a key not active on the current screen or select an invalid parameter value, an ERROR indicator appears in the right-hand corner. This indicator disappears as soon as you make a correct operation.
  - If you select a parameter value incompatible with the current operating state or other parameters, you will see a message that explains the error.
- When done with the current screen, press **<Esc>** to return to the previous screen, or type **!** to return directly to the main menu.

## Ending a Terminal Configuration Session

### ➤ To end the current terminal session:

- Type **&**.

After a session is ended, it is necessary to enter again a valid user name and password to start a new session.

## Working with Web Terminal

### Web Browser Requirements

The following Web browsers can be used to access the Optimux-108 supervision utility from any location that enables access to the Optimux-108 using Internet protocols.

- Internet Explorer 6.0 and up, running on Windows™
- Netscape Communicator 7.0 and up, running on Windows™, HPOV or Linux
- Firefox 1.0.4 and up, running on Windows™

- Mozilla 1.4.3 and up, running on Linux.

However, before using Web access, it is necessary to perform a preliminary configuration of Optimux-108.

When using a Web browser, pay attention to the following points:

- Enable scripts
- Configure the firewall that is probably installed on your PC in order to allow access to the destination IP address
- Disable pop-up blocking software (such as Google Popup Blocker); you may also have to configure your spyware/adware protection program to accept traffic from/to the destination IP address
- Browsers store the last viewed pages in a special cache. To prevent configuration errors, it is absolutely necessary to flush the browser's cache whenever you return to the same screen.

## Login

### ► To manage Optimux-108 via Web browser:

1. Open the Web browser.
2. Enter the IP address of Optimux-108 in the address field of the browser in the following format: **http://IP address** ('IP address' stands for the actual Optimux-108 IP address).
3. After entering the address, press **<Enter>** to command the browser to connect.
4. After the opening window is displayed ( *Figure 3-4*), click **LOGIN**.



Figure 3-4. Web Browser Access, Typical Log-in Window



Figure 3-5. Web Browser Access, User Name and Password Entry Window



5. In the Password Entry window ( *Figure 3-5*), log in by entering your user name (*user*) and password (*1234*).

The Main menu is displayed ( *Figure 3-6*).

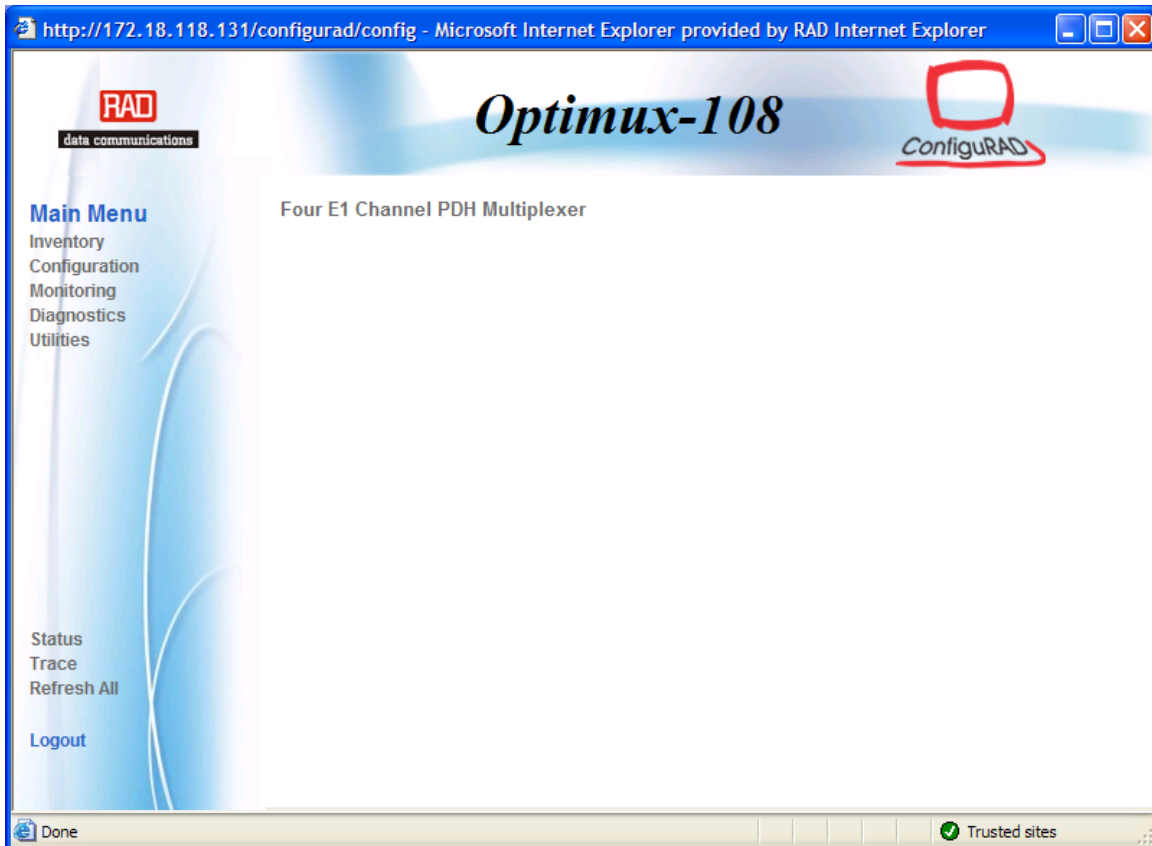


Figure 3-6. Web Browser Access, Typical Main Menu Window

6. Use standard browser operating procedures to perform the desired activities.

#### Notes

- It is recommended to change default passwords to prevent unauthorized access to the unit.
- Optimux-108 allows up to three management sessions to be active at a time. This includes up to two network sessions (Telnet, ConfiguRAD, RADview) and one ASCII terminal session.
- If no user input is detected for 5 minutes during ConfiguRAD session, Optimux-108 automatically disconnects from the management station.

### Navigating the ConfiguRAD Menus

ConfiguRAD is a Web-based remote access terminal management software. It provides a user-friendly interface for configuring, monitoring and performing diagnostic tests on the Optimux-108 units.

#### ► To choose an option:

1. Click a link in the ConfiguRAD screen to display the next menu.
2. Once the target screen is displayed, select a value from the drop-down box or enter it in a text box.

At the left-hand bottom corner ConfiguRAD provides some auxiliary management tools:

- Status – shows the number of users currently managing Optimux-108
- Trace – opens an additional pane for system messages, progress indicators (ping, software and configuration file downloads) and alarms. It is recommended to keep the trace pane open all the time.
- Refresh All – refreshes all ConfiguRAD display elements.

## Working with SNMP-based Management System

### RADview-PC/TDM and RADview-HPOV/TDM

RADview-PC and RADview-HPOV are user-friendly and powerful SNMP-based element management systems, used for planning, provisioning, and managing heterogeneous networks. RADview software provides a graphical user interface for monitoring RAD products via their SNMP agents.

RADview management software for Optimux-108 is bundled in the RADview-PC/TDM and RADview-HPOV/TDM packages for PC (Windows-based) or Unix, respectively.

For more details about this network management software, and for detailed instructions on how to install, set up, and use RADview, contact your local Authorized Business Partner or refer to the RADview-PC/TDM and RADview-HPOV/TDM User's Manuals, located on the Technical Documentation CD or on RAD's Web site.

### Third-party SNMP-based NMS

Alternatively, Optimux-108 can be managed via a third-party SNMP-based NMS.

Optimux-108 supports several management information bases (MIBs). A MIB (Management Information Base) is a database of managed objects. The MIB contains the data regarding the network elements being controlled and monitored. Each characteristic of the element to manage is defined as an object in the MIB. The MIB is a hierarchical tree structure that acts as the repository for defined objects. Each object has an object name, a type, syntax, an access code (read-write, read-only, not-accessible, and write-only) and a status (mandatory, optional, obsolete).

Optimux-108 supports appropriate groups (tables) of MIB II (SNMP standard MIB), and the RAD Private MIB as follows:

MIB	Notes	Tables
RFC3418	MIB-II	IANAiftype
RFC2863	MIB-II	if
RFC3593	MIB-II	PreHist-TC
RFC3895	Partially supported	dsx1ConfigTable

MIB	Notes	Tables
RAD Private MIB	Partially supported	–
	– radGen	physicalConnectorTable
	– optimux	mngTrapIPTable agnTrapMask (object) agnLed (object) OptMxConfigTable

Additional MIB information can be obtained from your local Authorized Business Partner.

For the trap list, see [Chapter 5](#)

## 3.5 Menu Map

Use the terminal menus to set and view configuration parameters. [Figure 3-7](#) illustrates the main menu and its submenus. Use this tree as a reference aid while performing configuration and control functions. Refer to [Chapter 4](#) and [Chapter 5](#) to find specific parameters.

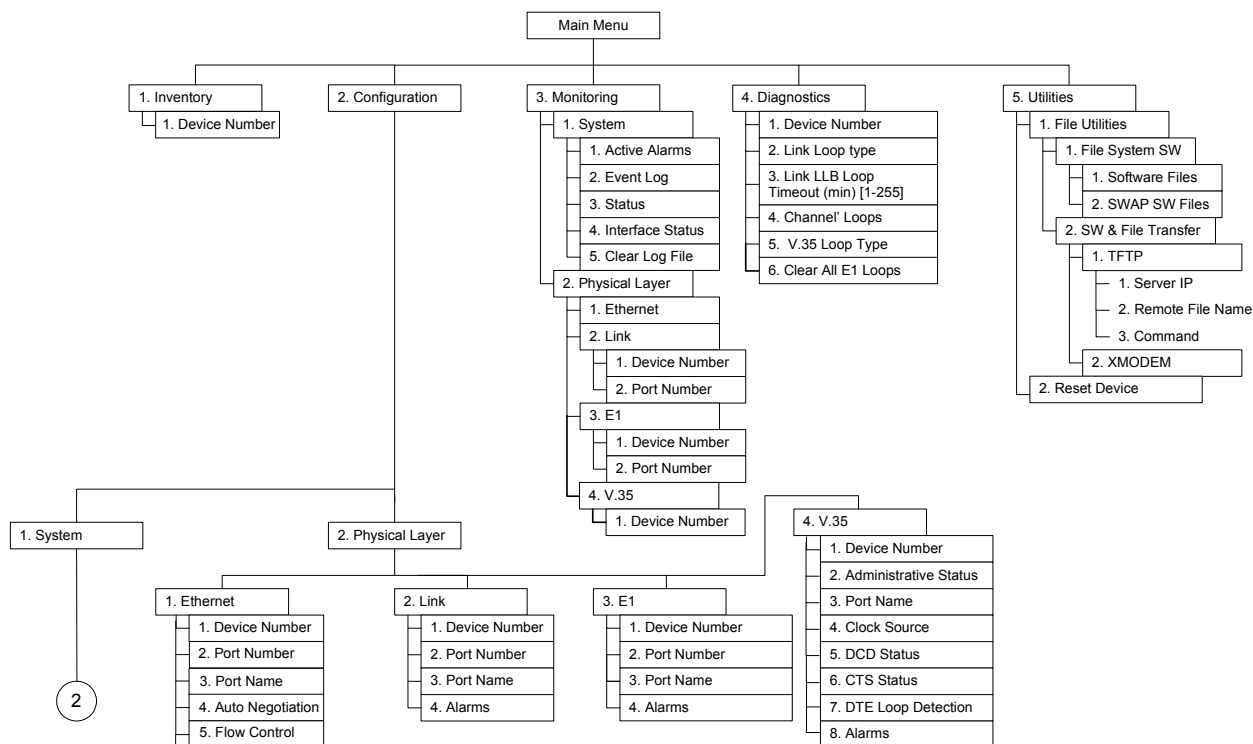


Figure 3-7. Main Menu Tree - Optimux-108 with V.35 User Port

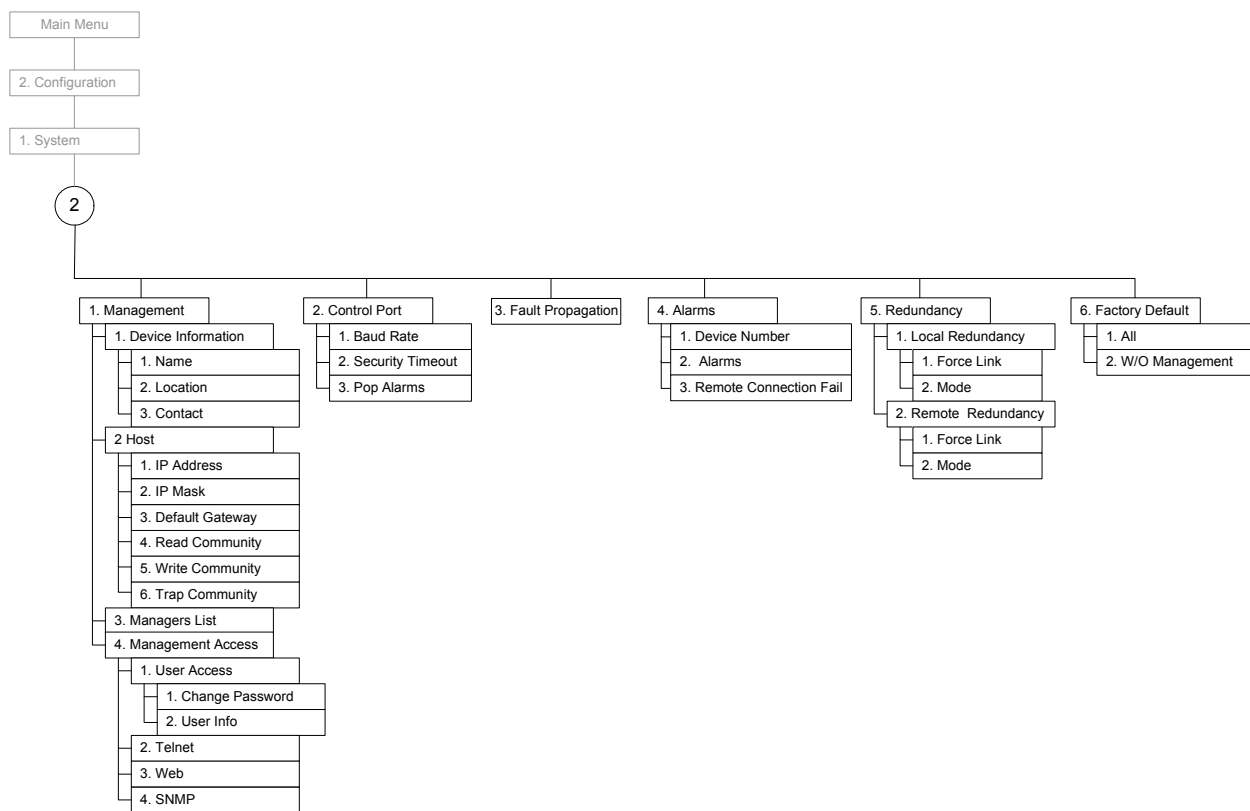


Figure 3-8. Main Menu Tree - Optimux-108 with V.35 User Port (cont.)

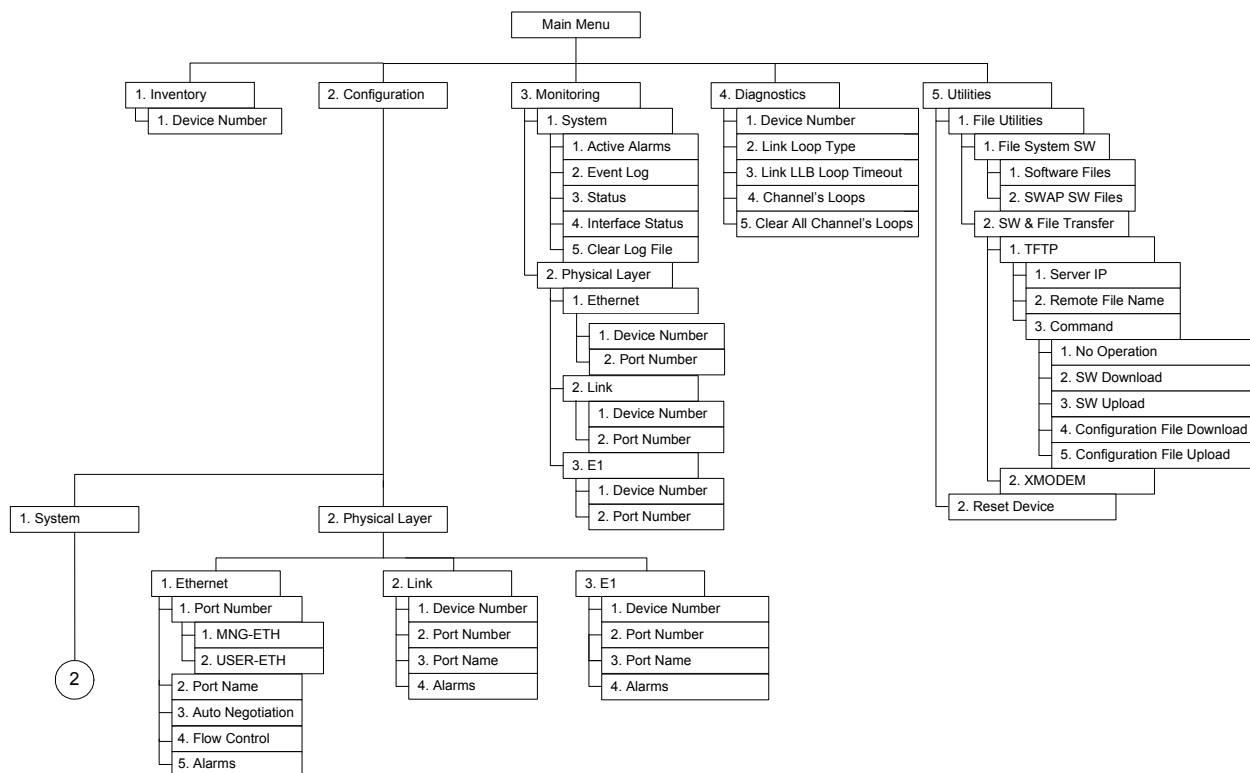


Figure 3-9. Main Menu Tree - Optimux-108 with Ethernet User Port

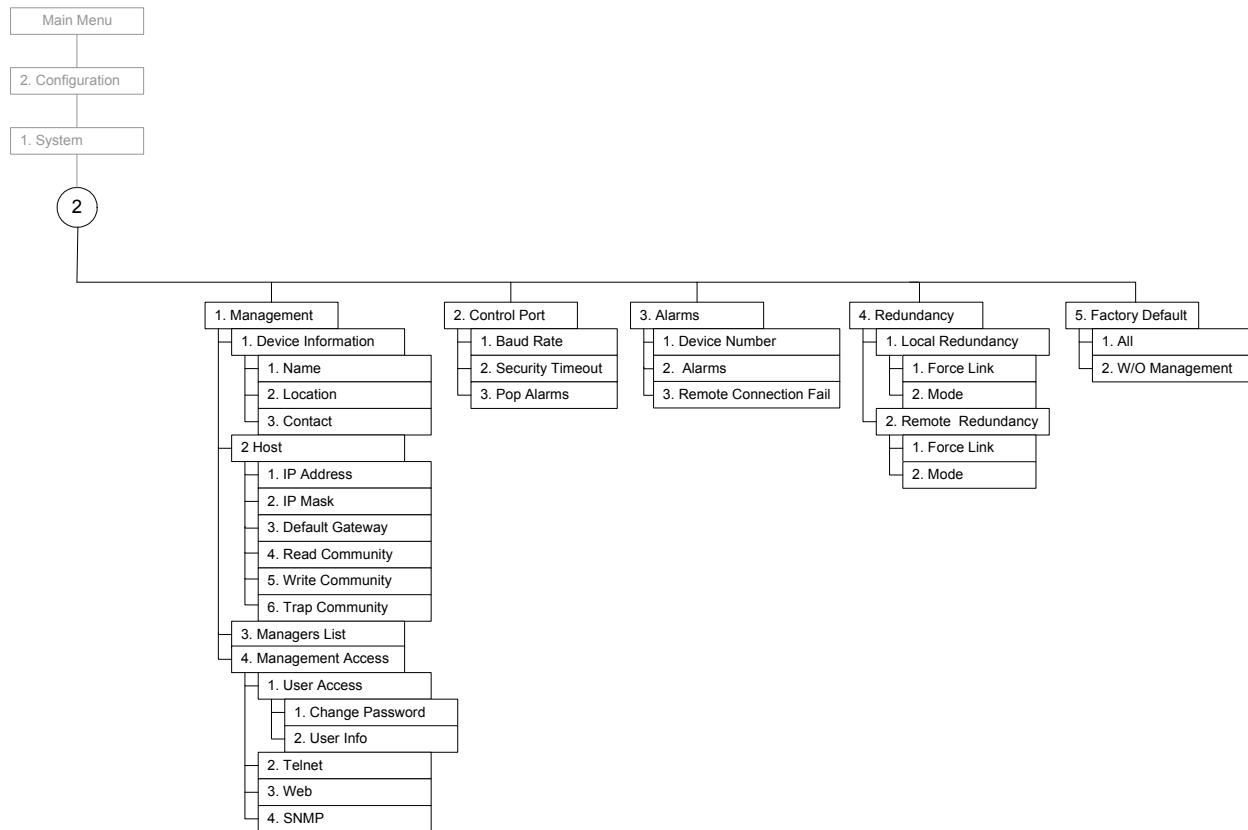


Figure 3-10. Main Menu Tree - Optimux-108 with Ethernet User Port (cont.)

## 3.6 Turning Off the Unit

- To power off the unit:
  - Remove the power cord from the power source.



# Chapter 4

---

## Configuration

This chapter illustrates the configuration Optimux-108 screens and explains their parameters.

Menu trees of the Optimux-108 management software are shown in [Chapter 3](#).

---

### 4.1 Configuring Optimux-108 for Management

Usually, initial configuration of the management parameters is performed via an ASCII terminal. Once the Optimux-108 host IP parameters are set, it is possible to access it via Telnet, ConfiguRAD or RADview for operation configuration. Perform the following steps in order to configure Optimux-108 for management:

- [Setting the Device Information](#)
- [Configuring IP Host Parameters](#)
- [Configuring Optimux-108 Communities](#)
- [Configuring the Network Managers](#)
- [Setting up the Managers List](#)
- [Controlling Management Access.](#)

#### Entering Device Information

The Optimux-108 management software allows you to assign a name to the unit, add its description, specify its location to distinguish it from the other devices installed in your system, and assign a contact person.

► **To enter device information:**

1. From the System menu, select **Management**.
2. From the Management menu, select **Device Information**.

The Device Information menu appears (see [Figure 4-1](#)).

3. From the Device Information menu, select **Name** and enter a desired name for the Optimux-108 unit.
4. Select **Location** and enter the desired name for the current Optimux-108 location.
5. Select **Contact** and enter the name, phone, and/or any other details of the contact person you want to save in this field.

```

Optimux-108
Configuration>System>Management>Device Information

Description ... (OP-108 HW Version:0.00/A, SW Version:6.10)
1. Name ... (Optimux-108)
2. Location ... (The location of this device)
3. Contact ... (Name of contact person)

>
Please select item <1 to 3>
ESC-Previous menu; !-Main Menu; &-Exit

```

Figure 4-1. Device Information Menu

## Configuring IP Host Parameters

When you integrate the Optimux-108 into your network, you will need to set the network parameters of the Optimux-108.

► To define the IP parameters:

1. From the Management menu, select **Host**.

The Host menu is displayed (see [Figure 4-2](#)).

2. From the Host menu, perform the following:
  - Select **IP Address** to define the host IP address
  - Select **IP Mask** to define the host IP mask.
  - Select **Default Gateway** to set the default gateway IP address

**Note**

*The default gateway must be in the same subnet as the host.*

```

Optimux-108
Configuration>System>Management>Host

1. IP Address ... (0.0.0.0)
2. IP Mask ... (0.0.0.0)
3. Default Gateway ... (0.0.0.0)
4. Read Community ... (public)
5. Write Community ... ()
6. Trap Community ... ()

>
Please select item <1 to 6>
ESC-Previous menu; !-Main Menu; &-Exit

```

Figure 4-2. Host Menu

## Configuring Optimux-108 Communities

For establishing a proper management link, you must specify the SNMP trap, read and write communities.



➤ **To configure Optimux-108 communities:**

1. From the Management menu, select **Host**.

The Host (Management) menu is displayed (see *Figure 4-2*).

2. From the Host menu, do the following:
  - Select **Read Community** to enter the name of a community with read-only authorization.
  - Select **Write Community** to enter the name of a community with write authorization.
  - Select **Trap Community** to enter the name of a community to which Optimux-108 sends traps.

## Setting up the Manager List

By default, any remote management terminal is allowed to change the configuration of the Optimux-108. You may enhance the security of the site by limiting remote management to specific management terminals or nodes. The Manager List lists the network nodes from which management may take place.

Optimux-108		
Configuration>System>Management>Managers List		
Num	IP Address	Trap
1	(0.0.0.0)	Unmasked
2	(0.0.0.0)	Unmasked
3	(0.0.0.0)	Unmasked
4	(0.0.0.0)	Unmasked
5	(0.0.0.0)	Unmasked
6	(0.0.0.0)	Unmasked
7	(0.0.0.0)	Unmasked
8	(0.0.0.0)	Unmasked
9	(0.0.0.0)	Unmasked
10	(0.0.0.0)	Unmasked
1. Change Cell ... (0.0.0.0)		
>		
ESC-Previous menu; !-Main Menu; &-Exit; ?-Help		

*Figure 4-3. Managers List Screen*

➤ **To define the managers list:**

1. The list contains 10 entries. Press **D** to move down the list; press **U** to move up the list. Press **L** to select the previous field; press **R** to select the next field.
2. To change the value of a field, select the field (it will appear highlighted), then choose **Change Cell** and then enter the new value.

When the Trap field is set to **Unmasked**, a trap is sent to this agent.

## Controlling Management Access

You can enable or disable access to the Optimux-108 management system via an SNMP, Telnet or Web-based application. By disabling SNMP, Telnet or Web, you prevent unauthorized access to the system when security of the Optimux-108 IP address has been compromised. When SNMP, Telnet and Web access is disabled, Optimux-108 can be managed via an ASCII terminal only. In addition, you can limit access to the device to only the stations defined in the manager list. *Figure 4-4* details management access implementation, depending whether the network managers are defined or not.

► To define the management access method:

1. From the Management menu, select **Management Access**.

The Management Access menu appears (see *Figure 4-4*).

```

Optimux-108
Configuration>System>Management>Management Access

1. User Access          >
2. Telnet               >      (All)
3. WEB                 >      (All)
4. SNMP                >      (All)

>
Please select item <1 to 4>
ESC-Previous menu; !-Main Menu; &-Exit

```

*Figure 4-4. Management Access Menu*

2. From the Management Access menu, select **Telnet** to configure Telnet access, select **SNMP** to configure SNMP access, or select **WEB** to configure Web access.
3. Define access mode for each management method:
  - All (access is allowed for all stations)
  - None (access is not allowed)
  - Manager Only (access is allowed only for the stations appearing in the manager list).

## Listing Users

The following screen lists information about all users defined in the device.

```

Optimux-108
. . . >User Info

User Name    Access level  Dynamic/Permanent
1  USER      RO          Permanent
2  SU         RW          Permanent

ESC-Previous menu; !-Main Menu; &-Exit; ?-Help

```

*Figure 4-5. User Information Screen*

Table 4-1. User Information Fields

Field	Possible Values	Description
User Name		Name of user defined in the device.
Access level	RO	Read Only. This user can display information, but cannot modify parameters.
	RW	Read/Write. This user has full control over the device and can modify parameters.
Dynamic/Permanent	Permanent	Indicates whether this user name is built into the system or added by an administrator. Built-in users are permanent.
	Dynamic	

## Configuring Control Port Parameters

Optimux-108 embedded software enables you to configure the serial port parameters, which include specifying terminal baud rate, controlling pop alarms and security timeout.

➤ **To access the Control Port menu:**

- From the System Configuration menu, select **Control Port**.

The Control Port menu appears (see [Figure 4-6](#)).

```

Optimux-108
Configuration>System>Control Port
1. Baud rate > (115200 bps)
2. Security Timeout (10 min.)
3. Pop Alarms (ON)

>
Please select item <1 to 3>
ESC-Previous menu; !-Main Menu; &-Exit

```

Figure 4-6. Control Port Menu

➤ **To configure the control port data rate:**

- From the Control Port menu, select **Baud Rate**.

The Baud Rate menu appears (see [Figure 4-7](#)).

- Select the terminal rate by typing the number corresponding to the desired value, and pressing **<Enter>**.

**Note**

*The Baud Rate parameter is masked during Telnet and ConfiguRAD sessions.*

```
Optimux-108
Configuration>System>Control Port>Baud Rate      (115200 bps)

1. 9600 bps
2. 19200 bps
3. 38400 bps
4. 57600 bps
5. 115200 bps

ESC-prev.menu; !-main menu; &-exit                1 Mngr/s
```

Figure 4-7. Baud Rate Menu

## Configuring Security Timeout

The timeout specifies a time interval after which Optimux-108 automatically disconnects from the supervisory terminal or Telnet host if no input from the user is detected. The timeout value can be in the range of 1 to 60 minutes.

➤ **To configure the security timeout:**

- From the Control Port menu ( [Figure 4-6](#)), select **Security Timeout** to set it to OFF or to 10 minutes.

The display is refreshed and a new value appears.

## Displaying New Alarms

This option allows you to display new alarms at the bottom of the terminal screen (**Pop Alarms=On**). Regardless of the Pop Alarms setting (On or Off), the alarms are written to the log file.

## Configuring the MNG-ETH port

The MNG-ETH port serves for the management of Optimux-108 via Telnet, ConfiguRAD, RADview or other SNMP management software.

➤ **To configure the MNG-ETH port:**

1. From the Configuration menu select **Physical Layer>Ethernet**.

The Ethernet menu is displayed.

```

Optimux-108
Configuration>Physical Layer>Ethernet

1. Device Number      >      (Local)
2. Port number        >      (MNG-ETH)
3. Port Name          . . .  ()
4. Auto Negotiation   >      (Enabled)
5. Flow Control       >      (Enabled)
6. Alarms             >      (Unmasked)

>
Please select item <1 to 6>
ESC-Previous menu; !-Main Menu; &-Exit                      1 user(s)

```

Figure 4-8. Ethernet Menu (Management Port)

In the Optimux-108 with Ethernet user port, the Ethernet menu may display the configuration for ETH-USER port. To toggle between configurations, select **Port Number** and the Port Number Menu appears ( [Figure 4-9](#)).

2. Select **Device Number** to set the device location (local or remote).
3. Select **Port Number** to set the Fast Ethernet port number to **ETH-MNG**.
4. Select **Auto Negotiation** to toggle between the **Enabled** and **Disabled** options.
5. Select **Flow Control** to toggle between the **Enabled** and **Disabled** options.
6. Select **Alarms** to mask or unmask the Fast Ethernet alarms. This option identifies whether alarms triggered by this Ethernet port are masked or not. When masked, these alarms are not trapped and are not recorded in the log file.

## 4.2 Configuring Optimux-108 for Operation

The recommended configuration procedure for Optimux-108 includes the following stages:

1. Configuring device-level parameters (link protection)
2. Configuring the uplink, tributary and user interfaces at the physical level.

### Configuring the Ethernet User Port

➤ To configure the Ethernet User port:

1. From the Ethernet menu ( [Figure 4-8](#)), select Port Number.

The Port Number menu opens.

```

Optimux-108
Configuration>Physical Layer>Ethernet>Port Number

1. ETH-MNG
2. ETH-USER

>
Please select item <1 to 2>
ESC-prev. menu; !-main menu; &-Exit                                1 User(s)

```

Figure 4-9. Port Number Menu

- From the Port Number Menu (see [Figure 4-9](#)) choose **ETH-USER**.

The Ethernet User menu appears.

```

Optimux-108
Main Menu>Configuration>Physical Layer>Ethernet

1. Device number          > (Local)
2. Port number            > (USER-ETH)
3. Administrative status  (UP)
4. Port name              ...()
5. Auto Negotiation       . (Enabled)
6. Flow Control           > (Enabled)
7. Alarms                 > (Unmasked)

>
Please select item <1 to 6>
ESC-Previous menu; !-Main Menu; &-Exit                                1 User(s)

```

Figure 4-10. Ethernet USER Menu

- Select **Device Number** to select a device (**Local** or **Remote**).
- Select **Administrative Status** and set the status to either **Up** or **Down**.
- Select **Port Name** to set a name to the port (up to 15 characters).
- Select **Autonegotiation** and toggle between the **Enabled** or **Disabled** options.
- Select **Flow Control** to toggle between the **Enabled** or **Disabled** options.
- Select **Alarms** to mask or unmask the USER Ethernet alarms. This option identifies whether alarms triggered by this Ethernet port are masked or not. When masked, these alarms are not trapped and are not recorded in the log file.

## Configuring the Fault Propagation

Optimux-108 has an option of Alarm Forwarding (Fault Propagation) of the USER-ETH port.

### ► To configure the fault propagation:

- From the Configuration menu, select **System**.

The System Configuration menu opens. The alarm forwarding option is disabled by default.

```

Optimux-108
Configuration>System
1. Management >
2. Control Port >
3. Fault Propagation (Off)
4. Alarms >
5. Redundancy >
6. Factory Default >

>
Please select item <1 to 6>
ESC-Previous menu; !-Main Menu; &-Exit 1 User(s)

```

Figure 4-11. System Configuration Menu

2. Type **3** to enable alarm forwarding:

- When signal loss or sync loss is detected on the uplink, the USER-ETH port on both (local and remote products) is shut down.
- When the USER-ETH port detects that the link is down, the USER-ETH port on the remote product is automatically shut down.

## Configuring E1 Channel Parameters

The following menu is used to configure the E1 ports.

```

Optimux-108
Configuration>Physical Layer>E1
1. Device Number > (Local)
2. Port number [1-4] > (1)
3. Port Name ... ()
4. Alarms > (Unmasked)

>
Please select item <1 to 4>
ESC-Previous menu; !-Main Menu; &-Exit 1 User(s)

```

Figure 4-12. E1 Configuration Screen

Table 4-2. E1 Channel Parameters

Parameter	Possible Value	Description
Device Number	Local Remote	Identifies whether parameters shown are for the local or remote device.
Port number	1 to 4	Identifies the E1 port to configure.
Port Name	String of up to 15 characters Default: Null	A name to easily identify this E1 port.

Parameter	Possible Value	Description
Alarms	Masked	Identifies whether alarms triggered by this port are masked or not. When masked, these alarms are not trapped and are not recorded in the log file.
	Unmasked	

## Configuring Uplink Parameters

- To configure uplinks:
  - From the Main menu, choose Configuration>Physical Layer>Link.

Optimux-108		
<u>Configuration&gt;Physical Layer&gt;Link</u>		
1. Device Number	>	(Local)
2. Port number	>	(LINK A)
3. Port Name	...	()
4. Alarms	>	(Unmasked)
>		
Please select item <1 to 4>		
ESC-Previous menu; !-Main Menu; &-Exit		1 User(s)

Figure 4-13. Link Menu

Table 4-3. Uplink Parameters

Parameter	Possible Value	Description
Device Number	Local	Identifies whether parameters shown are for the local or remote device.
	Remote	
Port number	LINK A or LINK B	Identifies the uplink port to configure.
Port Name	String of up to 15 characters Default: Null	A name to easily identify this uplink port.
Alarms	Masked	Identifies whether alarms triggered by this port are masked or not. When masked, these alarms are not trapped and are not recorded in the log file.
	Unmasked	

## Configuring V.35 Parameters

The following menu is used to configure parameters of the optional V.35 interface.



```

Optimux-108
Configuration>Physical Layer>V.35

1. Device Number                >      (Local)
2. Administrative status        >      (Up)
3. Port Name                    ...    ( )
4. Clock Source                 >      (Internal)
5. DCD Status                   >      (Permanent ON)
6. CTS Status                   >      (Permanent ON)
7. DTE Loop Detection           >      (Disable)
8. Alarms                       >      (Unmasked)

>
Please select item <1 to 8>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)

```

Figure 4-14. V.35 Menu

Table 4-4. V.35 Parameters

Parameter	Possible Value	Description
Device Number	<b>Local</b> Remote	Identifies whether parameters shown are for the local or remote device.
Administrative status	<b>UP</b> Down	Identifies whether interface is Up or Down. In case it is down, all other parameters are not displayed
Port Name	String of up to 15 characters <b>Default: Null</b>	A name to easily identify this uplink port.
Clock Source	<b>Internal</b> LBT External	Identifies whether V.35 interface clock is internal, LBT (Loop back timing) or External
DCD Status	<b>Permanent ON</b> Controll	Identifies whether DCD (Data Carrier Detect) is permanently set to ON or it is set to ON only when there is no signal failure in the active link.
CTS Status	<b>Permanent ON</b> Controll	Identifies whether CTS (Clear to Send) is permanently set to ON or it is set to ON only when RTS (Request to Send) is ON.
DTE Loop Detection	<b>Disable</b> Enable	Identifies whether DTE is able to set LLB loop on V.35 interface. Disable – LLB loop is not applied. Enable – LLB is applied

Parameter	Possible Value	Description
Alarms	Masked	Identifies whether alarms triggered by this port are masked or not. When masked, these alarms are not trapped and are not recorded in the log file.
	Unmasked	

## Configuring Redundancy

### Configuring Local Redundancy

Optimux-108		
Configuration>System>Redundancy>Local Redundancy		
1. Force Link		(LINK A)
2. Mode	>	(Auto)
>		
Please select item <1 to 2>		
ESC-Previous menu; !-Main Menu; &-Exit		

Figure 4-15. Local Redundancy Menu

Table 4-5. Local Redundancy Parameters

Parameter	Possible Values	Description
Force Link	Link A	Sets the active link.
	Link B	
Mode	Auto	When the selected main link (for example, Link A) fails, Optimux-108 automatically switches over to the backup Main Link (Link B, in this example). When Link A recovers, the active link returns to Link A.
	Manual	When the selected Force Link fails, the system switches to the backup link. The backup link remains in use, even if the Force Link returns to service.
	Off	Turns off redundancy. When the selected Main Link fails, Optimux-108 does not change over to the backup Main Link.

#### Note

*You can set the mode for the remote device, which will then perform redundancy according to the status of its links.*

## Configuring Remote Redundancy

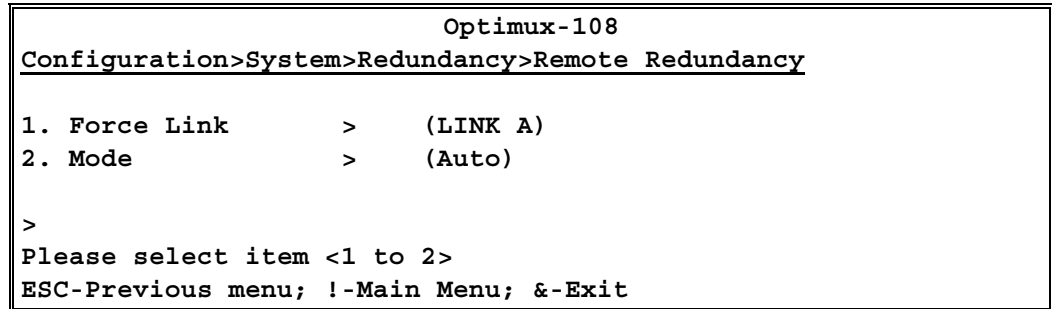


Figure 4-16. Remote Redundancy Menu

The parameters for configuring remote redundancy are the same as those for configuring local redundancy. For more information, see [Table 4-5](#).

---

## 4.3 Performing Additional Tasks

### Displaying the Optimux-108 Inventory

The Optimux-108 inventory displays description of the unit, its hardware revision and software version, various ports installed, power supply type and other components.

► To display the Optimux-108 inventory:

1. From the Main menu, select **Inventory**.

The Inventory menu appears. [Figure 4-17](#) shows an inventory screen for Optimux-108 with V.35 User Port.

2. In the Inventory screen, use the arrow keys to navigate between the pages.

```

Optimux-108
Inventory
1. Device Number      > (Local)
   Device type        > (Optimux-108)
   Boot version       ... (1.02 mng 10.03)
   SW version         ... (6.10E04)
   HW version         ... (0.00/A_Firmware: 4A Ver. 1.00)
INTERFACES INFORMATION
Link A                ... (Module not installed)
Link B                ... (Module not installed)
E1 Channel 1-4        ... (COAX, Unbalanced(75ohm))
V.35                  ... (Smart Serial)
ETH-MNG               ... (RJ-45, 10/100BaseT)
Dry Contact           ... (RJ-45)
Control Port          ... (Mini USB 5, RS-232)
PS A type             > (AC/DC)
PS B type             > (AC/DC)
>
Please select item <1 to 1>
ESC-prev. menu; !-main menu; &-exit                      1 user(s)

```

Figure 4-17. Inventory Screen for Optimux-108 with V.35 User Port

## Displaying Optimux-108 Status

The Optimux-108 software provides access to the following status information:

- System level – MAC address, connection status, system uptime period, link protection (redundancy) status
- Physical ports status – Uplink, E1 tributary ports, Ethernet ports (Management and optional User), optional V.35 user port

The status information is available via the Monitoring menu.

### ► To access the Monitoring menu:

- From the Main menu, select **Monitoring**.

The Monitoring menu appears (see [Figure 4-18](#)).

```

Optimux-108
Monitoring
1. System            >
2. Physical Layer    >
ESC-prev. menu; !-main menu; &-exit                      1 user(s)

```

Figure 4-18. Monitoring Menu

## Displaying System Status Information

The System menu specifies MAC address of the Optimux-108 unit and system uptime period, and provides access to the information on the interface connection status, and link protection (redundancy) status. For description of Optimux-108 system messages, which are displayed via the Event Log and Active Alarms screen, refer to [Chapter 5](#).

You can monitor the following aspects of the Optimux-108 system:

- System up-time
- MAC address
- Alarms and events
- Interface status

The System Monitoring menu screen is shown in [Figure 4-18](#). [Table 4-6](#) explains the System Monitoring parameters.

Optimux-108	
<b>Monitoring&gt;System</b>	
MAC Address	(0020D222E15F)
Sys Up Time	... (0 days 05:06:34)
1. Active Alarms	[]
2. Event Log	[]
3. Status	>
4. Interface Status	[]
5. Clear Log File	
>	
Please select item <1 to 5>	
ESC-Previous menu; !-Main Menu; &-Exit	
1 User(s)	

*Figure 4-19. Monitoring Menu*

*Table 4-6. System Monitoring Parameters*

Parameter	Description
MAC Address	The address the device holds when transmitting frames via the Ethernet port.
Sys Up Time	Elapsed time since system was powered up.
Active Alarms	Displays active alarms on a local and remote devices, their severity (Major or Minor) and status (Masked or Unmasked). For description of Active Alarms screen, refer to <a href="#">Chapter 6</a> .
Event Log	Displays the events logged by the system. Displays the source of the event, alarm indicated as the result of the event, its status (ON, OFF, NA) and severity (Major, Minor or Event). It can be maximum 200 entries to the log file. For description of Event Log screen, refer to <a href="#">Chapter 6</a> .
Status	Displays the detailed system status
Interface Status	Displays the current interface status (UP, DOWN, NA), type and speed for all the interfaces
Clear Log File	Clears the log file

### Displaying the System Status

The System Status screen displays the current status of the local or remote Optimux-108 units. [Table 4-7](#) lists the values and the meaning of these parameters.

Optimux-108	
<u>Monitoring&gt;System&gt;Status</u>	
1. Device Number	> (Local)
Device Type	> (Optimux-108)
Force Link	> (LINK A)
Active Link	> (LINK A)
Redundancy Status	> (Available)
Redundancy Mode	> (Auto)
PS A status	> (OK)
PS B status	> (OK)
Alarm Indication	> (Major)
Test Indication	> (Off)
>	
Please select item <1 to 1>	
ESC-Previous menu; !-Main Menu; &-Exit	
1 User(s)	

Figure 4-20. System Status Screen

Table 4-7. System Status Parameters

Parameter	Description
Device Number	Indicates the Optimux-108 currently being monitored: <ul style="list-style-type: none"> <li>Local</li> <li>Remote</li> </ul>
Device Type	Displays the device type
Redundancy Status	Indicates if redundancy is available or not available <ul style="list-style-type: none"> <li>Available – two uplinks are installed</li> <li>Not Available – only one uplink is installed, or Redundancy mode is 'OFF'</li> </ul>
Redundancy Mode	The redundancy state of the system: <ul style="list-style-type: none"> <li>Auto</li> <li>Manual</li> <li>Off</li> </ul> The option is hidden when redundancy status is not available.
Force Link	Indicates the main uplink
Active link	Identifies the currently active link
PS A Status	The state of Power Supply A: <ul style="list-style-type: none"> <li>OK</li> <li>Fault</li> <li>Not mounted (in case only one PS has been ordered – PS B)</li> </ul>

Parameter	Description
PS B Status	The state of Power Supply B: <ul style="list-style-type: none"> <li>• OK</li> <li>• Fault</li> <li>• Not mounted (in case only one PS has been ordered – PS A)</li> </ul>
Alarm Indication	Current system status: <ul style="list-style-type: none"> <li>• Normal - System is functioning normally; no alarms activated</li> <li>• Major - One or more major alarms are currently activated</li> <li>• Minor - One or more minor alarms are currently activated</li> </ul>
Test Indication	Indicates whether any tests are currently active in the device: <ul style="list-style-type: none"> <li>• ON - Tests are currently active in the device</li> <li>• OFF - No tests are currently running</li> </ul>

► **To set the device to monitor:**

- From the Status menu, Enter **1**.

The Device Number toggles between **Local** and **Remote**, to indicate the device currently being monitored.

### ***Monitoring the Interface Status of the System***

The Interface Status Screen displays the current status of the local and remote interfaces.

Optimux-108				
Monitoring>System>Interface Status				
	Description	Type	Operation	Speed
1	Loc uplink A	Proprietary	Up	101904000
2	Loc uplink B	Proprietary	Down	101904000
3	Loc Ch-1	E1	Up	2048000
4	Loc Ch-2	E1	Up	2048000
5	Loc Ch-3	E1	Up	2048000
6	Loc Ch-4	E1	Up	2048000
7	Loc MNG-ETH	ETH	Up	100000000
8	Loc V.35	V.35	Down	204800
ESC-Previous menu; !-Main Menu; &-Exit;?-Help				1 User(s)

*Figure 4-21. Remote System Status Screen (Optimux-108 with V.35 User Port)*

Optimux-108				
<u>Monitoring&gt;System&gt;Interface Status</u>				
	Description	Type	Operation	Speed
1	Loc uplink A	Proprietary	Up	135168000
2	Loc uplink B	Proprietary	Down	135168000
3	Loc Ch-1	E1	Up	2048000
4	Loc Ch-2	E1	Up	2048000
5	Loc Ch-3	E1	Up	2048000
6	Loc Ch-4	E1	Up	2048000
7	Loc MNG-ETH	ETH	Up	100000000
8	Loc USER-ETH	ETH	UP	100000000
>				
ESC-Previous menu; !-Main Menu; &-Exit; ?-Help				1 User(s)

Figure 4-22. Remote System Status Screen (Optimux-108 with Ethernet User Port)

## Monitoring the Physical Ports

You can monitor the status of the following physical ports on the Optimux-108:

- Uplink
- E1 tributary ports
- V.35 serial port
- User Ethernet port
- Management Ethernet port.

### ***Ethernet Ports***

The Ethernet Status Screen displays the current status of the Management and User Ethernet ports.

---

**Note** For a device with V.35 user port, only Ethernet Management port information is relevant.

---

To display the status of the Ethernet ports:

1. From the Monitoring menu, select **Physical Layer > Ethernet**.

The Ethernet management port screen is displayed.



```

Optimux-108
Monitoring>Physical Layer>Ethernet

1. Device Number          > (Local)
1. Port number            > (MNG-ETH)
   Operation               > (Up)
   Auto negotiation Status > (Completed)
   Speed & Duplex          > (100Mbps Full Duplex)
   Alarm                   > (Unmasked)

>
Please select item <1 to 1>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)

```

Figure 4-23. MNG-ETH Status Screen

- To see the ETH-USER status, select 2.

The ETH-USER screen is displayed.

```

Optimux-108
Monitoring>Physical Layer>Ethernet

1. Device Number          > (Local)
2. Port number            > (USER-ETH)
   Administrative status   > (Up)
   Operation               > (Up)
   Auto negotiation Status > (Completed)
   Speed & Duplex          > (100Mbps Full Duplex)
   Alarm                   > (Unmasked)

>
Please select item <1 to 1>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)

```

Figure 4-24. ETH-USER Screen

### ***Uplink***

The Link Status Screen displays the current status of the Uplink port.

```

Optimux-108
Monitoring>Physical Layer>Link

1. Device Number          > (Local)
2. Port Number            > (LINK A)
   Operation               > (Up)
   Alarm Indication        > (Normal)
   Test Indication         > (Off)
   Alarm                   > (Unmasked)

>
Please select item <1 to 2>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)

```

Figure 4-25. Uplink Status Screen

Table 4-8. Uplink Status Parameters

Parameter	Possible Values	Description
Device Number	<b>Local</b> Remote	Identifies the device currently being monitored.
Port Number	<b>LINK A</b> or LINK B	Identifies the uplink currently being monitored.
Operation	<b>Up</b> Down	Indicates the current operational status of the device.
Alarm Indication	<b>Normal</b> Signal loss	Indicates the highest status level of current alarms.
Test Indication	On <b>Off</b>	Indicates whether a loopback test is currently being run.
Alarm	Masked <b>Unmasked</b>	Identifies whether alarms on the device are masked or not. When masked, Ethernet alarms are not trapped.

➤ **To monitor the status of the uplink:**

1. To toggle between the local and remote device, enter **1**.

The Device Number changes to identify the unit currently being monitored.

2. To toggle between LINK A and LINK B, enter **2**.

The screen displays the current status of the selected port on the selected device.

### ***E1 Tributary Ports***

Optimux-108		
<b>Monitoring&gt;Physical Layer&gt;E1</b>		
1. Device Number	>	(Local)
2. Port Number [1-4]	>	(1)
Operation	>	(Down)
Alarm Indication	>	(Signal loss)
Test Indication	>	(Off)
Alarm	>	(Unmasked)
>		
Please select item <1 to 2>		
ESC-Previous menu; !-Main Menu; &-Exit		1 User(s)

Figure 4-26. E1 Port Status Screen

The E1 port parameters are the same as those in the Uplink Status Screen. For more information, see [Figure 4-25](#).

► **To monitor the status of the E1 port:**

1. To toggle between the local and remote device, enter **1**.

The Device Number changes to identify the unit currently being monitored (**Local** or **Remote**).

2. To select an E1 port to monitor, enter **2** and then the port number (1 to 4).

The screen displays the current status of the selected port on the selected device.

### **V.35 Port**

Optimux-108		
Monitoring>Physical Layer>V.35		
1. Device Number	>	(Local)
Administrative Status	>	(Up)
Operation	>	(Down)
Alarm Indication	>	(Signal loss)
Test Indication	>	(Off)
Alarm	>	(Unmasked)
>		
Please select item <1 to 1>		
ESC-Previous menu; !-Main Menu; &-Exit		1 User(s)

Figure 4-27. V.35 Port Status Screen

Table 4-9. V.35 Status Parameters

Parameter	Possible Values	Description
Device Number	<b>Local</b> Remote	Identifies the device currently being monitored
Administrative Status	<b>Up</b> Down	Identifies if DTE is connected to the V.35 port
Operation	<b>Up</b> Down	Indicates the current operational status of the device
Alarm Indication	<b>Normal</b> Signal loss	Indicates the highest status level of current alarms
Test Indication	On <b>Off</b>	Indicates whether a loopback test is currently being run
Alarm	Masked <b>Unmasked</b>	Identifies whether or not an alarm on the device is masked. When masked, a V.35 alarm is not trapped. If a Telebras cable is connected, the alarm should be masked.

► **To monitor the status of the V.35 port:**

- To toggle between the local and remote device, enter **1**.

The Device Number changes to identify the unit currently being monitored (**Local** or **Remote**).

## Changing a Password

To enhance security, you can specify a password to control access to the Optimux-108 management functions. Pay attention that each line at the "Change Password screen" (see [Figure 4-29](#)) appears only after the previous change. All the instructions appear at the bottom of the screen. The access to the Change Password Screen is according to the next figure:

```

Optimux-108
Configuration>System>Management>Management Access>User Access

1. Change Password          >
2. User info                []

>
Please select item <1 or 2>
ESC-Previous menu; !-Main Menu; &-Exit

```

*Figure 4-28. Access to the Change Password Screen*

### ► To change the password:

1. Choose <1> and enter the existing User Name (SU for example) and then press **Enter**.
3. Enter the existing password
4. Choose **New Password** and then enter the new password. The new password may contain up to eight characters.
5. Choose **Confirm New Password** and then enter the password entered in the previous step.

A confirmation message appears confirming the password change.

```

Optimux-108
. . . >Change Password

1. User Name          ...    (SU)
2. Password           ...    (****)
3. New Password       ...    (****)
4. Confirm New Password ...    -

Please confirm new password (Up to 8 characters)
-----

PLEASE CONFIRM PASSWORD!

```

*Figure 4-29. Change Password Screen*

## Transferring Software and Configuration Files

This section presents procedures for installing new software releases into the Optimux-108 units and transferring configuration files.

Optimux-108 stores two software versions, each of them in one of the two 1.15 MB partitions of its flash memory, which also contains a boot program. The software is stored in compressed format. The main version is decompressed and loaded into the Optimux-108 RAM upon power-up. The backup software is kept for backup purposes. If the main software becomes corrupted, you can swap it with the backup. By default, Optimux-108 is delivered with active software only.

New software releases are distributed as **\*.img** files, which are downloaded to Optimux-108. When starting a download, Optimux-108 erases the current backup and places the new software in the backup partition. When downloading is complete, the unit checks the integrity of the new software file. If it is correct, the backup and active files are swapped. The new software release becomes active and the former active software becomes the backup. If a failure occurs during downloading, the new version is erased. In this case, only one version is left stored in the flash memory. The backup software can be downloaded to the unit and swapped with the main software later.

Downloading software is performed using the TFTP or X-Modem protocols. The software files can also be downloaded to Optimux-108 via Boot Manager, using XMODEM or TFTP, as explained in [Appendix B](#).

## Viewing File System Information

Information about the file system is accessed via the following screen.

```

Optimux-108
Utilities>File Utilities>File System
1. SW Files          []
2. SWAP SW Files

>
Please select item <1 to 2>
ESC-Previous menu; !-Main Menu; &-Exit          1 User(s)

```

Figure 4-30. File System Menu

➤ To view information about the file system:

- Choose **SW Files**.

The SW Files screen is displayed, showing information about the active and backup software partitions as well as the boot version.

Optimux-108	
Utilities>File Utilities>File System>SW Files	
Software active version	6.10E04
Software active partition	0
Code size	483993
Date <dd-mm-yy>	06-08-07
Software backup version	0.00n00
Software backup partition	1
Code size	0
Date <dd-mm-yy>	00-00-00
Boot version	1.02
Boot mng version	10.03
>	
ESC-Previous menu; !-Main Menu; &-Exit;?-Help	
1 User(s)	

Figure 4-31. SW Files Screen

## Swapping the Software Files

When the software file is downloaded to the backup partition, it can be swapped with the main software file.

### ► To swap between software versions:

1. To swap the active and backup software partitions, choose **SWAP SW Files** (see [Figure 4-30](#)).

Optimux-108 reboots from the other partition.

2. After the system has come up, display the SW Files screen to verify that the change took place.

## Resetting Factory Defaults

You can reset Optimux-108 to its default settings. Either all configuration parameters can be reset to their default values, or you can reset Optimux-108 without affecting its management settings (host IP address, mask, default gateway and the network managers).

### ► To reset Optimux-108 to the default settings:

1. From the System menu, select **Factory Default**.

The Factory Default menu is displayed (see [Figure 4-32](#)).

2. From the Factory Default menu, do the following:

- Select **All** to reset all configuration parameters to their defaults
- Select **W/O Management** to reset all configuration parameters, except for the management settings.

Optimux-108 displays the following message: **Configuration will be lost and system will be reset. Continue???** (Y/N).

3. Type **Y** to confirm the reset.

Optimux-108 performs the required type of reset.

```
Optimux-108
Configuration>System>Factory Default
1. All >
2. W/O Management >
>
Please select item <1 to 2>
ESC-Previous menu; !-Main Menu; &-Exit 1 user(s)
```

Figure 4-32. Factory Default Reset

**Note** In the TELNET and WEB screens, the option All is not displayed.

## Resetting Optimux-108

You can perform the overall reset of Optimux-108.

➤ **To reset Optimux-108:**

1. From the Main Menu, choose **Utilities > Reset Device**.

A confirmation message is displayed.

2. Type **Y** to confirm the reset.





# Chapter 5

---

## Monitoring and Diagnostics

---

### 5.1 Monitoring Performance

You can monitor the following aspects of the Optimux-108 system:

- System up-time
- MAC Address
- Alarms and events
- Interface status
- Local system status
- Remote system status.

```
Optimux-108
Monitoring>System
    MAC Address      ...    (00-20-D2-22-E1-5F)
    Sys Up Time     ...    (05:06:34)
1. Active Alarms    [1] >
2. Event Log        [5] >
3. Status           >
4. Interface Status [ ] >
5. Clear Log File

>
Please select item <1 to 5>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)
```

*Figure 5-1. Monitoring Menu*

*Table 5-1. System Monitoring Parameters*

Parameter	Description
MAC Address	The address that the device holds when transmitting frames via the Ethernet port.
Sys Up Time	Elapsed time since system was powered up.
Active Alarms	Displays the active alarms. To view the alarms, enter <b>1</b> .
Event Log	Displays the events logged by the system. To view the events, enter <b>2</b> .
Status	Enter <b>3</b> to display the detailed system status.
Interface Status	Displays the current interface status. To view the detailed interface status, enter <b>4</b> .
Clear Log File	To clear the log file, enter <b>5</b>

## Monitoring the Status of the System

The System Status screen displays the current status of the local or remote Optimux-108 unit.

Optimux-108	
<u>Monitoring&gt;System&gt;Status</u>	
1. Device Number	> (Local)
Device Type	> (Optimux-108)
Force Link	> (LINK A)
Active Link	> (LINK A)
Redundancy mode	> (AUTO)
Redundancy Status	> (Available)
PS A status	> (OK)
PS B status	> (OK)
Alarm Indication	> (Major)
Test Indication	> (Off)
>	
Please select item <1 to 1>	
ESC-Previous menu; !-Main Menu; &-Exit	
1 User(s)	

*Figure 5-2. System Status Screen*

*Table 5-2. System Status Parameters*

Parameter	Description
Device Number	Indicates the Optimux-108 currently being monitored: <ul style="list-style-type: none"> <li>Local</li> <li>Remote</li> </ul>
Device type	Displays the device type
Redundancy status	Indicates if redundancy is available or not available <ul style="list-style-type: none"> <li>Available – two uplinks are mounted</li> <li>Not Available – only one uplink is mounted or Redundancy mode is 'OFF'</li> </ul>
Redundancy mode	The redundancy state of the system: <ul style="list-style-type: none"> <li>AUTO</li> <li>MANUAL</li> <li>OFF</li> </ul> The option is hidden when redundancy status is not available.
Force Link	Indicates the main uplink
Active Link	Identifies the currently active link
PS A Status	The state of the Power Supply A: <ul style="list-style-type: none"> <li>OK</li> <li>Fault</li> </ul>
PS B Status	The state of the Power Supply B: <ul style="list-style-type: none"> <li>OK</li> <li>Fault</li> </ul>
Alarm Indication	Current system status: <ul style="list-style-type: none"> <li>Normal - System is functioning normally; no alarms activated</li> <li>Major - One or more major alarms are currently activated</li> <li>Minor - One or more minor alarms are currently activated</li> </ul>
Test Indication	Indicates whether any tests are currently active in the device: <ul style="list-style-type: none"> <li>ON - Tests are currently active in the device</li> <li>OFF - No tests are currently running</li> </ul>

➤ **To set the device to monitor:**

- Enter **1**.

The Device Number toggles between **Local** and **Remote**, to indicate the device currently being monitored.

## Monitoring the Interface Status of the System

The Interface Status Screen displays the current status of the local and remote interfaces.

Optimux-108				
<u>Monitoring&gt;System&gt;Interface Status</u>				
	Description	Type	Operation	Speed
1	Loc uplink A	Proprietary	Up	101904000
2	Loc uplink B	Proprietary	Down	101904000
3	Loc Ch 1	E1	Up	1544000
4	Loc Ch 2	E1	Up	1544000
5	Loc Ch 3	E1	Up	1544000
6	Loc Ch 4	E1	Up	1544000
7	Loc MNG-ETH	ETH	Up	100000000
8	Loc USER-ETH	ETH	UP	100000000
>				
ESC-Previous menu; !-Main Menu; &-Exit; ?-Help				1User(s)

Figure 5-3. Remote System Status Screen

## Monitoring the Physical Ports

You can monitor the following aspects of the physical ports on the Optimux-108:

- Management port status
- User port status
- Uplink status
- Channel status.

## Monitoring the Status of the Ethernet Port

The Ethernet Status Screen displays the current status of the local or remote Ethernet port.

To display the status of the Ethernet port:

1. From the Monitoring menu, select **Physical Layer**.

The Physical Layer menu is displayed.

2. From the Physical Layer menu, select **Ethernet**.

The Ethernet screen is displayed.

```

Optimux-108
Monitoring>Physical Layer>Ethernet

1. Port number          > (MNG-ETH)
   Operation            > (Up)
   Auto negotiation Status > (Completed)
   Speed & Duplex        > (100Mbps Full Duplex)
   Alarm                > (Unmasked)

>
Please select item <1 to 1>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)

```

Figure 5-4. MNG-ETH Status Screen

Table 5-3. MNG-ETH Status Parameters

Parameter	Possible Values	Description
Operation	Up Down	Indicates the current operational status of the device.
Autonegotiation Status	Completed	Indicates the current status of autonegotiation.
Speed & Duplex	100Mbps Full Duplex 100Mbps Half Duplex 10Mbps Full Duplex 10Mbps Half Duplex	Indicates the speed and duplexity configured for the Ethernet port.
Alarm	Masked Unmasked	Identifies whether alarms on the device are masked or not. When masked, Ethernet alarms are not trapped.

- To see the ETH-USER status, select 2.
- Select ETH-USER port (2).

The USER-ETH screen is displayed.

```

Optimux-108
Monitoring>Physical Layer>Ethernet

1. Port number          > (USER-ETH)
   Administrative status > (Up)
   Operation            > (Up)
   Auto negotiation Status > (Completed)
   Speed & Duplex        > (100Mbps Full Duplex)
   Alarm                > (Unmasked)

Please select item <1 to 1>
ESC-Previous menu; !-Main Menu; &-Exit

```

Figure 5-5. USER-ETH Status Screen

Table 5-4. USER-ETH Status Parameters

Parameter	Possible Values	Description
Administrative status	Port Status	Indicates the port status
Operation	Up Down	Indicates the current operational status of the device.
Autonegotiation Status	Completed	Indicates the current status of autonegotiation.
Speed & Duplex	100Mbps Full Duplex 100Mbps Half Duplex 10Mbps Full Duplex 10Mbps Half Duplex	Indicates the speed and duplexity configured for the Ethernet port.
Alarm	Masked Unmasked	Identifies whether alarms on the device are masked or not. When masked, Ethernet alarms are not trapped.

## Monitoring the Status of the Uplink

Optimux-108		
Monitoring>Physical Layer>Link		
1. Device Number	>	(Local)
2. Port Number	>	(LINK A)
Operation	>	(Up)
Alarm Indication	>	(Normal)
Test Indication	>	(Off)
Alarm	>	(Unmasked)
>		
Please select item <1 to 1>		
ESC-Previous menu; !-Main Menu; &-Exit		1 User(s)

Figure 5-6. Uplink Status Screen

Table 5-5. Uplink Status Parameters

Parameter	Possible Values	Description
Device Number	Local Remote	Identifies the device currently being monitored.
Port Number	LINK A or LINK B	Identifies the uplink currently being monitored.
Operation	Up Down	Indicates the current operational status of the device.

Parameter	Possible Values	Description
Alarm Indication	<b>Normal</b> Signal loss	Indicates the highest status level of current alarms.
Test Indication	<b>On</b> <b>Off</b>	Indicates whether a loopback test is currently being run.
Alarm	<b>Masked</b> <b>Unmasked</b>	Identifies whether alarms on the device are masked or not. When masked, Ethernet alarms are not trapped.

► **To monitor the status of the uplink:**

1. To toggle between the local and remote device, enter **1**.

The Device Number changes to identify the unit currently being monitored.

2. To toggle between LINK A and LINK B, enter **2**.

The screen displays the current status of the selected port on the selected device.

## Monitoring the Status of the E1 Port

Optimux-108		
<u>Monitoring&gt;Physical Layer&gt;E1</u>		
1. Device Number	>	(Local)
2. Port Number [1..4]	>	(1)
Operation	>	(Down)
Alarm Indication	>	(Signal loss)
Test Indication	>	(Off)
Alarm	>	(Unmasked)
>		
Please select item <1 to 2>		
ESC-Previous menu; !-Main Menu; &-Exit		1 User(s)

Figure 5-7. E1 Port Status Screen

The E1 port parameters are the same as those in the Uplink Status Screen. For more information, see [Figure 5-6](#).

► **To monitor the status of the E1 port:**

1. To toggle between the local and remote device, enter **1**.

The Device Number changes to identify the unit currently being monitored (**Local** or **Remote**).

2. To select a E1 port to monitor, enter **2** and then the port number (1 to 4).

The screen displays the current status of the selected port on the selected device.

## 5.2 Detecting Problems

### Front Panel LEDs

The status of Optimux-108 is indicated by the Link A and B, CH1 to CH4 and power supply LED indicators located on the front panel. For the description of LEDs and their functions, refer to [Chapter 3](#).

### Alarms and Traps

Optimux-108 detects fault conditions and initiates alarms and events to alert the user:

- **Alarms** (major and minor) have two statuses: ON and OFF. The alarm status automatically changes to OFF when a fault condition that triggered the alarm is cleared.
- **Events** have only ON status.

Handling events and alarms is done via the System Monitoring menu (shown in [Figure 5-8](#)) and described in the following sections.

```

Optimux-108
Monitoring>System
    MAC Address                (0020D222E15F)
    Sys Up Time                ... (0 days 05:06:34)
1. Active Alarms              []
2. Event Log                  []
3. Status                    >
4. Interface Status          []
5. Clear Log File
>
Please select item <1 to 5>
ESC-Previous menu; !-Main Menu; &-Exit                1 User(s)

```

*Figure 5-8. System Monitoring Menu*

Optimux-108 maintains a separate log files for events and active alarms.

Optimux-108 supports SNMP traps for the following events:

- Cold start
- Link up
- Link down
- Authentication failure
- TFTP status change
- Agent status change
- Line status change
- Power status change



- Alarm

The list of traps is given in [Table 5-6](#).

*Table 5-6. Trap List*

Trap	Description	OID
coldStart	The unit has been restarted	1.3.6.1.6.3.1.1.5.1
authenticationFailure	User authentication has failed	1.3.6.1.6.3.1.1.5.5
linkDown	An uplink, tributary or user port has been disconnected	1.3.6.1.6.3.1.1.5.3
linkUp	An uplink, tributary or user port has been connected	1.3.6.1.6.3.1.1.5.4
tftpStatusChangeTrap	TFTP session status has changed	1.3.6.1.4.1.164.6.1.0.1
agnStatusChangeTrap	SNMP agent status has changed	1.3.6.1.4.1.164.6.1.0.2
optMxConfigChange	Status of one of the PS has changed	1.3.6.1.4.1.164.3.5.0.1
optMxAgentFault	Status of local-remote device connection has changed	1.3.6.1.4.1.164.3.5.0.2
optLineStatusChange	Status of uplink or E1 tributary links has changed	1.3.6.1.4.1.164.3.5.0.3
dacsMuxAlarmsTrap	An alarm occurred in the system	1.3.6.1.4.1.164.3.3.0.2

---

---

## 5.3 Handling Events

### Displaying Events

The Event log displays up to 200 events. When the event log buffer is full, each new event replaces the currently oldest event.

➤ **To access the event log:**

1. From the Monitoring menu, select **System**.

The System menu is displayed.

2. From the System menu, select **Event Log**.

The Event Log is displayed (see [Figure 5-9](#)).

3. In the Event Log screen, use the **U** and **D** keys to scroll the alarm list up and down.

Optimux-108				
Monitoring>System>Event Log				
	Source	Alarm	Status	Severity
1	Local Device	Remote connection fail	ON	MAJOR
2	Local Device	PS B fail	ON	MAJOR
3	Local MNG-ETH	ETH Integrity fail	ON	MAJOR
4	Local USER-ETH	ETH Integrity fail	ON	MAJOR
5	Local Device	Redundancy not available	ON	MAJOR
6	Local Ch-1	Signal Loss	ON	MAJOR
7	Local Ch-2	Signal Loss	ON	MAJOR
8	Local Ch-3	Signal Loss	ON	MAJOR
9	Local Ch-4	Signal Loss	ON	MAJOR
10	Local Device	Remote connection fail	OFF	MAJOR
->>				
ESC-prev.menu; !-main menu; &-exit; ?-help				1 Mngr/s

Figure 5-9. Event Log

The log displays the source of the event, alarm indicated as the result of the event, its status (ON, OFF, NA) and severity (Major Alarm, Minor Alarm or Event).

The Optimux-108 events are described in [Table 5-7](#).

Table 5-7. Optimux-108 Events

Code	Event	Description
100	Software process failed	Failed to process software download.
101	Buffer overflow	The event log buffer exceeded its maximum size and new events are written over the old ones.
102	Local login	Login was performed to the PUT.
103	Invalid Login	Login to the PUT with wrong user name or password.
104	SNMP authentication failure	Read/write via SNMP with wrong community
105	Cold Start	Power up event
106	Link Switch	Switch between Link A to Link B

## Clearing Events

### ► To clear the event log:

- From the System Log menu, select **Clear Log File**.  
A confirmation message appears.
- Enter **Yes** to clear the event log buffer.

## Displaying Active Alarms

► To access the active alarm list:

1. From the Monitoring menu, select **System**.

The System menu is displayed.

2. From the System menu, select **Active Alarms**.

The active alarm list is displayed (see [Figure 5-9](#)).

3. In the Active Alarms screen, use the **U** and **D** keys to scroll the alarm list up and down.

The list displays active alarms on the local and remote devices, their source, severity (Major or Minor) and status (Masked or Unmasked):

- **Masked** indicates an active alarm for which no trap is sent
- **Unmasked** indicates an active alarm for which trap is sent.

The source that generated the alarm can be one of the following:

- Local Device – system level alarm
- Remote Device – system level alarm
- Local LINK <A,B> – alarm generated on local uplink
- Remote LINK <A,B> – alarm generated on remote uplink
- Local E1 <number> – alarm generated on local E1 port
- Remote E1 <number> – alarm generated on remote E1 port
- Local Ethernet Management – alarm generated on local Ethernet port
- Remote Ethernet Management – alarm generated on remote Ethernet port
- Local USER-ETH – alarm generated on local user Ethernet port
- Remote USER-ETH – alarm generated on remote user Ethernet port
- Local V.35 – alarm generated on local V.35 port
- Remote V.35 – alarm generated on remote V.35 port

Optimux-108				
<u>Monitoring&gt;System&gt;Active Alarms</u>				
Source	Description	Severity	Status	
1 Local Device	Remote Connection Fail	Major	Unmasked	
2 Local Device	Redundancy not available	Major	Unmasked	
>				
ESC-Previous menu; !-Main Menu; &-Exit; ?-Help			1 User(s)	

*Figure 5-10. Active Alarms Screen*

The Optimux-108 alarms are described in [Table 5-8](#).

Table 5-8. Optimux-108 Alarms

Code	Terminal Message	Description	Port	Severity
1	PS A fail	No voltage in power supply A.		Major
2	PS B fail	No voltage in power supply B.		Major
3	Remote connection FAIL	A managment connection could not be established with the remote device.		Major
4	Redundancy not available	Redundancy mode is set to AUTO or MANUAL but the second link is not installed.		Major
30	ETH Integrity fail	Failure in Ethernet management or Ethernet user port integrity.	ETH-MNG ETH	Major
31	Signal Loss	Signal loss detected on uplinks or channels.	E1 LINK	Major
32	Loss of Frame	Frame loss detected on Uplink		Major
27	DTE Failure (for V.35 option only)	DTE is not ready/connected (identified only if ISO 2110 interface is connected to Optimux-108).	V.35	Major
33	Rx AIS	Received AIS on the channels.	E1	Minor

## Masking Alarms

You can configure whether various groups of alarms are trapped or not.

**Optimux-108**

**Configuration>System>Alarms**

1. Device Number > (Local)

2. Alarms (Unmasked)

3. Remote Connection Failed (Unmasked)

>

Please select item <1 to 3>

ESC-Previous menu; !-Main Menu; &-Exit 1 User(s)

Figure 5-11. Alarm Menu

Table 5-9. Alarm Configuration Parameters

Parameter	Possible Values	Description
Device Number	Local Remote	Sets whether local or remote device is to be masked or unmasked
Alarms	Masked Unmasked	Masked – The selected device alarms are masked Unmasked – The selected device alarms are unmasked

Parameter	Possible Values	Description
Remote Connection Failed	Masked	Masked – The selected remote connection alarms are masked
	Unmasked	Unmasked – The selected remote connection alarms are unmasked

## 5.4 Troubleshooting

If a problem occurs, check the displayed indications and refer to [Section 3-2](#) and [Table 3-1](#) for their interpretation.

Identify the trouble symptoms and perform the actions listed under Corrective Measures in the order given in [Table 5-10](#), until the problem is corrected.

*Table 5-10 Troubleshooting Chart*

Trouble Symptoms	Probable Cause	Corrective Measures
Optimux-108 does not respond	No power	Check that both ends of the power cable are properly connected. If the power cable is properly connected, but the power supply still does not respond, then the power supply is defective (see below). If Optimux-108 is powered from a DC source, check the polarity of the power connections.
	Defective Power Supply	Disconnect the power from both ends and replace with another power supply.
	Defective Optimux-108	Replace the Optimux-108.
PWR indicator lights in red or yellow	Defective power supply	Turn the respective power supply off for at least 10 minutes, and then turn it on again. If the PWR indicator is still red or yellow, have Optimux-108 repaired as soon as possible.
The SYNC LOSS indicator of the Uplink lights	External problem	Activate the local loopback on Optimux-108. Check that the SYNC LOSS and AIS indicators of the Uplink in use turn OFF. If the indicators turn off, check the E2 interface connections, the uplink transmission path to the remote unit, and the remote unit.
	Defective Optimux-108	Replace the Optimux-108.
	Defective Optimux-108	Activate the local loopback on Optimux-108. Check that the SYNC LOSS and AIS indicators of the Uplink in use turn OFF. If one of the indicators remains lit, replace Optimux-108.

Trouble Symptoms	Probable Cause	Corrective Measures
None of the units connected to a local Optimux-108 receive the remote equipment	External problem	Activate the local loopback on Optimux-108. Check that all the SYNC LOSS and AIS indicators turn OFF, and that the equipment connected to the local tributaries receives their own transmissions. If the indicators turn OFF, the problem is external. Troubleshoot the remote unit, and the uplink transmission path.
	Defective Optimux-108	Replace the Optimux-108.
Only one of the units connected to a local Optimux-108 does not receive the remote equipment	Equipment problem	Check the equipment connected to the local tributary, and its cable connections. Check the remote tributary equipment.
	Defective Optimux-108	Activate the uplink local loopback in the local Optimux-108. Check that any previously lit alarm indicators related to the tributary turns OFF.  If the indicator turns OFF, the problem is external; if the indicators remain lit, replace Optimux-108.
No menus are available	Incomplete downloading of new FLASH version	Turn Optimux-108 ON and proceed to download the new FLASH version again.

## 5.5 Performing Diagnostic Tests

Optimux-108 has comprehensive test and diagnostics capabilities that include local and remote loopbacks on the uplink interface and on each E1 tributary link. A local loopback is also supported on the optional V.35 user port.

Diagnostic loopbacks are configured and monitored using the following menu. [Figure 5-12](#) displays this menu for an Optimux-108 with a V.35 user interface port.

Optimux-108		
<b><u>Diagnostics</u></b>		
1. Device Number	>	(Local)
2. Link Loop type	>	(No Loop)
3. Link LLB loop timeout (min) [1-255]	...	(5)
4. Channel's Loops	[ ]	>
5. V.35 Loop Type		(No Loop)
6. Clear all channel's loops		
>		
Please select item <1 to 6>		
ESC-Previous menu; !-Main Menu; &-Exit		1 User(s)

Figure 5-12. Diagnostics Menu

The available loopback functions are described in the following paragraphs.

## Running Uplink Loopbacks

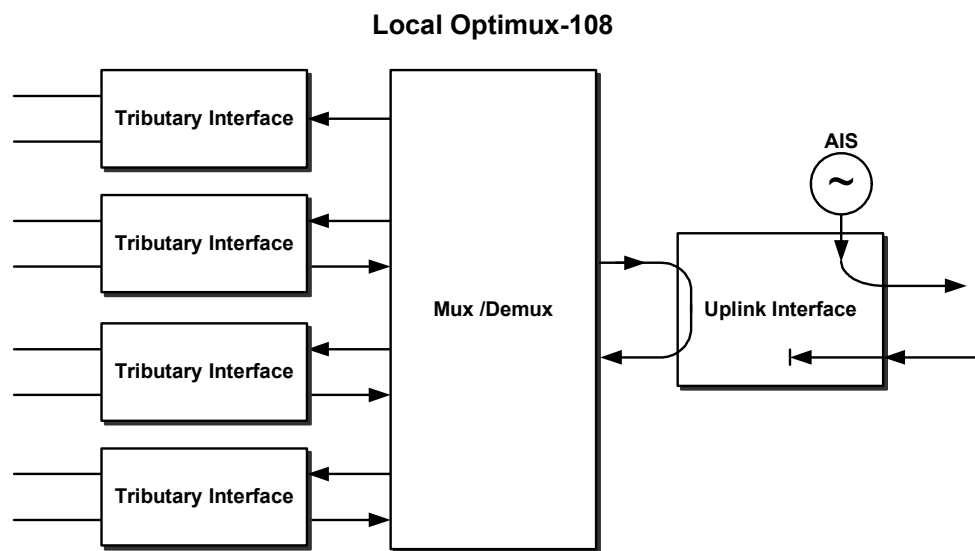
### Local Loopback on the Uplink

The uplink local loopback returns the transmit signal of the active uplink interface to the input of the receive path. Simultaneously, the local Optimux-108 sends an unframed all-ones signal to the uplink.

*Figure 5-13* shows the uplink local loopback connection for the Optimux-108 without optional V.35 or Ethernet user port. The diagrams for models with optional user ports are similar but do not include AIS on the uplink.

When this loopback is activated, the equipment connected to the local Optimux-108 tributary must receive its own transmission.

This test checks the operation of the local Optimux-108 and the connections to the equipment attached to the tributary interfaces.



*Figure 5-13 Uplink Local Loopback in the Optimux-108*

### Uplink Remote Loopback in Optimux-108

The LINK remote loopback returns the received signal of the active uplink interface to the input of the transmit path. Simultaneously, the remote Optimux-108 sends an unframed all-ones signal to the input of the uplink Demux.

**Note** *For V.35 interface version: when performing Uplink RLB, V.35 data on the remote Optimux-108 is not looped*

*Figure 5-14* shows the uplink remote loopback connection for the Optimux-108 without optional V.35 or Ethernet user port. The diagrams for models with optional user ports are similar but don't include AIS on the uplink.

This test checks the operation of the local Optimux-108 and the connection to the remote Optimux-108.

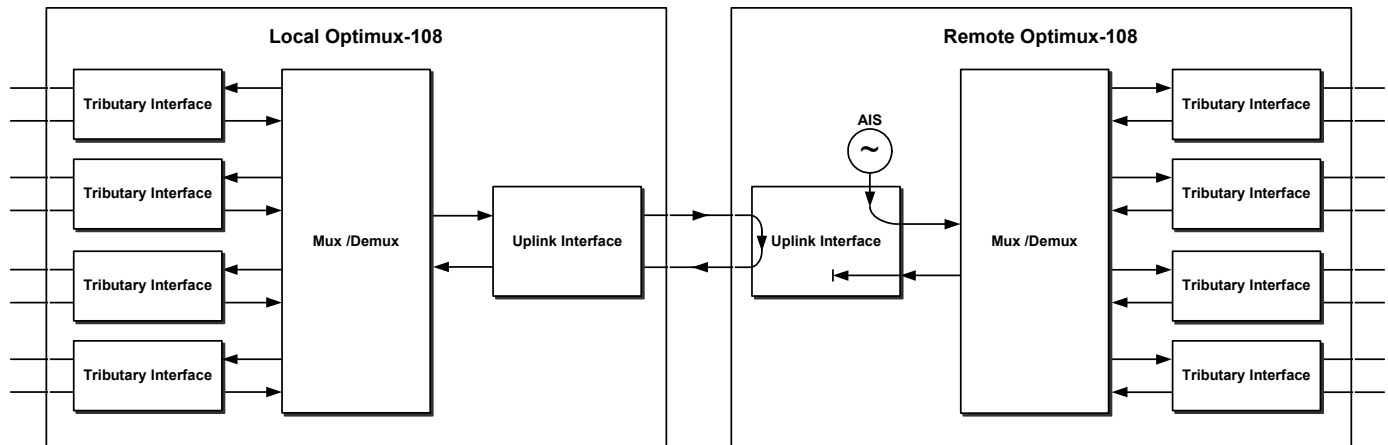


Figure 5-14. Uplink Remote Loopback in the Optimux-108

➤ **To run a loopback on an uplink:**

1. Set Device Number to the device being configured (Local or Remote).
2. Set the uplink LLB loop timeout to the number of minutes the loopback must run (1 to 255).
3. Set uplink Loop type to the type of loop to run on this device (LLB or RLB).

The loopback test begins running immediately after the loopback is set.

**Caution**

Setting the Uplink Local Loopback (LLB) in the remote Optimux-108 disconnects the link, and as such, is irreversible. To remove this loopback, connect a terminal to the remote unit or shut down the power to the remote unit. If you set the Uplink LLB timeout on the remote Optimux-108, the loopback test will stop after the specified timeout period.

## Running Loopbacks on E1 Tributary Channels

Optimux-108 features local and remote loopbacks on each E1 tributary link. The loopback is set separately for each E1 interface.

### E1 Tributary Local Loopback

The E1 local loopback returns the E1 transmit signal to the output of the receive path. Simultaneously, an unframed all-ones signal is sent to the MUX.

*Figure 5-15* shows the E1 local loopback connection.

This test checks the operation of the connections to the equipment attached to the local tributary interfaces.



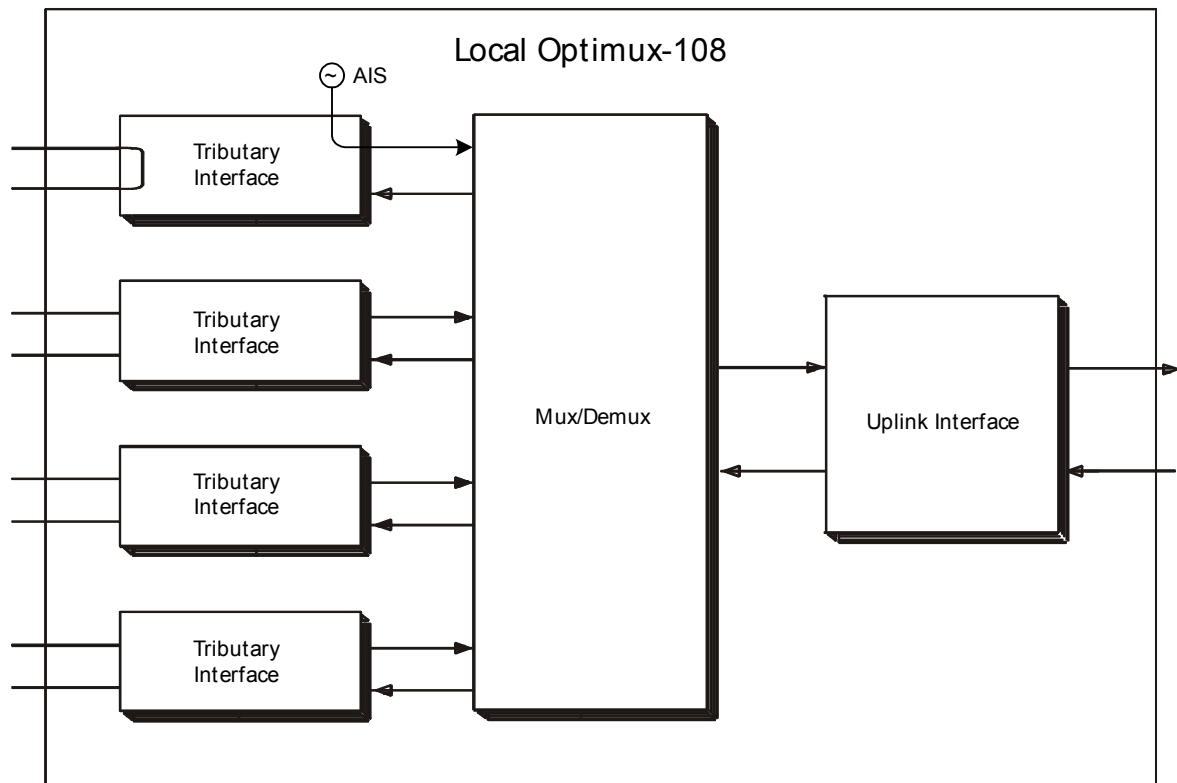


Figure 5-15. E1 Tributary Local Loopback

Each port can be set separately.

### E1 Tributary Remote Loopback

The E1 remote loopback returns the transmitted demultiplexed E1 to the receiver multiplexer. Simultaneously, the Optimux-108 sends an unframed all-ones signal to the E1 link.

Figure 5-16 shows the E1 remote loopback connection.

This test checks the operation of the local Optimux-108 and the connection to the remote Optimux-108 unit.

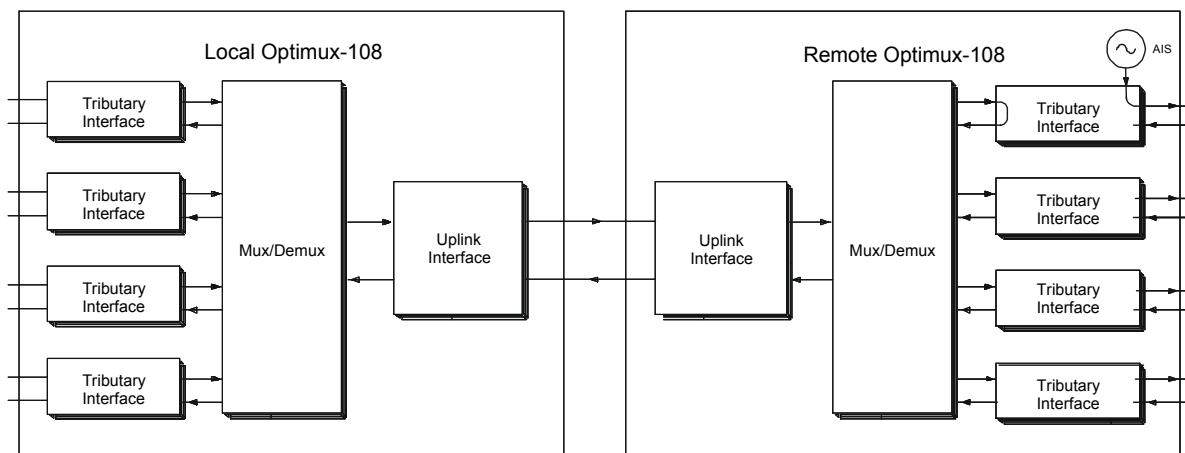


Figure 5-16. E1 Tributary Remote Loopback

► To run a loopback on an E1 tributary channel:

1. In the Diagnostics Menu (*Figure 5-12*), set Device Number to the device being configured (Local or Remote).
2. Choose **Channel's Loop**.

The Channel's Loop Screen (*Figure 5-17*) appears.

Optimux-108			
<u>Diagnostics&gt;Channel's Loop</u>			
Number	Loop	Number	Loop
1 Channel-1	No Loop	Channel-2	No Loop
2 Channel-3	No Loop	Channel-4	No Loop
1. No Loop 2. LLB 3. RLB  >			
Please select item <1 to 3>			
ESC-Previous menu; !-Main Menu; &-Exit			1 User(s)

*Figure 5-17. E1 Loop Screen*

3. Using the Tab key, highlight the Loop field of the channel you want to set.
4. Enter the loopback status you want to set:
  - No loop - No loopback on the channel
  - LLB - Local loopback on the channel
  - RLB - Remote loopback on the channel.

**Note** *The RLB option appears only if there is a connection to a remote device.*

The loopback test begins running immediately after a loopback has been set.

## Running Loopbacks on V.35 User Port

The optional V.35 user port supports only the local loopback.

The V.35 local loopback returns the V.35 transmit signal to the output of the receive path. *Figure 5-18* shows the V.35 local loopback connection.

This test checks the operation of the connections to the equipment attached to the local V.35 interfaces.

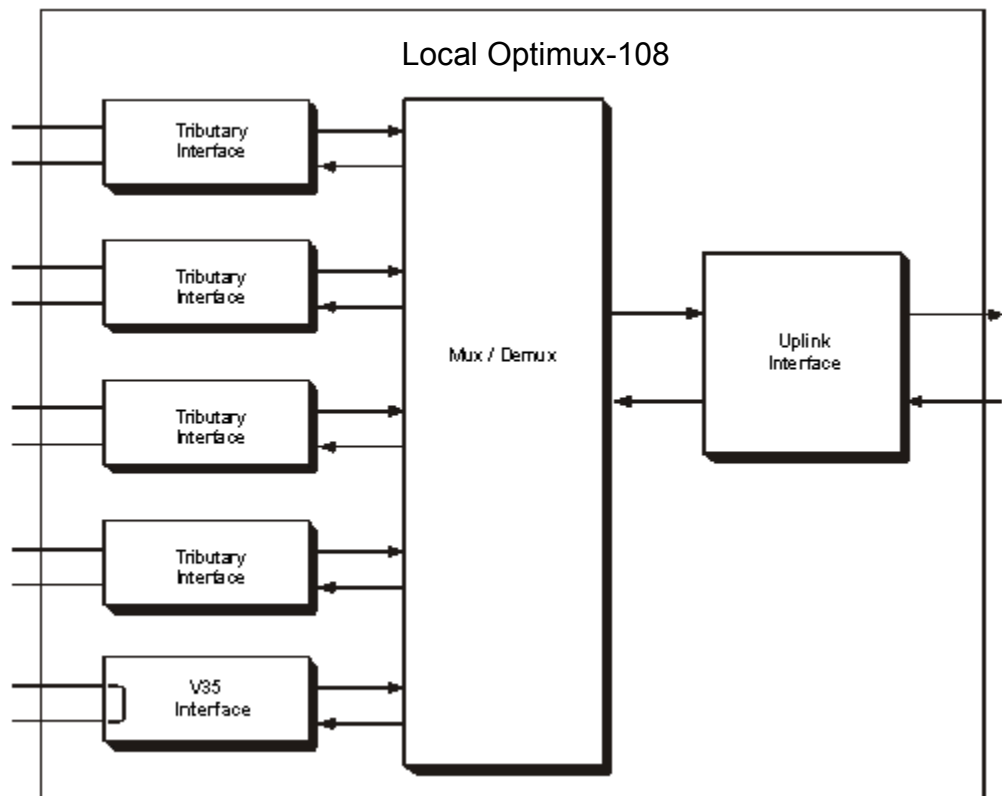


Figure 5-18 V.35 Local Loopback

► To run a loopback on a V.35 user port:

1. In the Diagnostics Menu (*Figure 5-12*), set Device Number to Local.
2. Choose **V.35 Loop Type**.

The loopback test begins running immediately after the loopback is set.

## Clearing Loopbacks

► To clear a specific loopback:

- Select **No loop** in the specific loopback screen.

The loopback test is disconnected immediately after this option is selected.

► To clear all loopbacks:

1. From the Diagnostics menu, select **Clear all channel's loops**.

All the loopback tests are disconnected immediately after this option is selected.

---

## 5.6 Frequently Asked Questions

**Q** Is Optimux-108 fiber main link line coding compliant with NRZ?

**A** Optimux-108 does not comply with NRZ. The fiber optic interface line code is scrambled NRZ. The fiber optic module is RAD proprietary, and cannot work opposite other vendors.

---

## 5.7 Technical Support

Technical support for this product can be obtained from the local authorized RAD partner from whom it was purchased.

For further information, please contact the authorized RAD partner nearest you or one of RAD's offices worldwide. This information can be found at [www.rad.com](http://www.rad.com) (offices – About RAD > Worldwide Offices; distributors – Where to Buy > End Users).

# Chapter 6

---

## Software Upgrade

Software upgrade is required to fix product limitations, enable new features, or to make the unit compatible with other devices that are already running the new software version.

The Optimux-108 stores up to two versions of the software – each one is a separate partition.

The information includes the following:

- Detailed conditions required for the upgrade
- Any impact the upgrade may have on the system
- Overview of downloading options
- Upgrade via the File Utilities menu
- Upgrade via the Boot menu.

---

### 6.1 Impact

Optimux-108 resets automatically after the software upgrade, resulting into up to two minutes of downtime. Upgrade to new version does not affect any user settings.

---

### 6.2 Software Upgrade Options

Application software can be downloaded to Optimux-108 via the TFTP menu (Main Menu > Utilities > File Transfer > TFTP), or via the Boot menu, using XMODEM or TFTP.

---

### 6.3 Prerequisites

This section details the Optimux-108 software and versions compatible with the new version. It also lists the software file names and outlines system requirements needed for the upgrade procedure.

## Software Files

The new version releases are distributed as software files named **OP-106.img**. The files can be obtained from the local RAD business partner from whom the device was purchased.

## System Requirements

Before starting the upgrade, verify that you have the following:

- For upgrade via TFTP:
  - Operational Optimux-108 unit with valid IP parameters configured for the host
  - Connection to a PC with a TFTP server application (such as 3Cdaemon or PumpKIN), and a valid IP address
  - Software file (**OP-106.img**) stored on the PC
- For upgrade via XMODEM:
  - Operational Optimux-108 unit
  - Connection to a PC with a terminal emulation application (such as HyperTerminal)
  - Software file (**OP-106.img**) stored on the PC.

---

---

### 6.4 Upgrading Optimux-108 Software via the File Utilities Menu

The recommended software downloading method is downloading by means of the TFTP, using the *Download/upload using TFTP* menu reached from the File Utilities menu.

Network administrators can use this procedure to distribute new software releases to all the managed Optimux-108 units in the network from a central location.

Use the following procedure to download the new software release to Optimux-108 via the File Utilities menu.

1. Verify that the **OP-106.img** is stored on the PC with the TFTP server application.
2. Verify that the Optimux-108 host has valid IP parameters.
3. Ping the PC to verify the connection.
4. Activate the TFTP server application.
5. Download the **OP-106.img** from the PC to Optimux-108.

---

**Note** *Configuration values shown in this chapter are examples only.*

---

## Verifying the Optimux-108 Host Parameters

The Optimux-108 host must have host IP parameters configured according to your network requirements. Otherwise you will not be able to establish a proper communication session with the TFTP server. Refer to the following manual section for additional information:

- *Connecting to the ASCII Terminal* in Chapter 2
- *Working with Terminal* in Chapter 3
- *Configuring IP Host Parameters* and *Configuring the Host Encapsulation* in Chapter 4.

➤ **To verify the Optimux-108 host parameters:**

- Display the Host IP menu (Configuration > System Configuration > Management > Host IP), and verify that the host IP address, IP mask and default gateway are configured according to your network requirements.

Optimux-108	
<u>Host IP</u>	
Host IP address	(172.17.161.73)
Host IP mask	(255.255.255.0)
Host default gateway	(172.17.161.1)
Read community	(public)
Write community	(public)
Trap community	(public)
>	
ESC-prev. menu; !-main menu; &-exit; @-scroll	

Figure 6-1. Configuring the Host

## Activating the TFTP Server

Once the TFTP server is activated on the PC, it waits for any TFTP file transfer request originating from the product, and carries out the received request automatically. *Transferring Software and Configuration Files* section in *Chapter 4* explains how to prepare your PC for the TFTP file transfer.

➤ **To run the TFTP server:**

- Activate a TFTP server application, such as **3Cdaemon** (available from [www.3com.com](http://www.3com.com)) or **PumpKIN** (available from <http://kin.klever.net/pumpkin/>).

## Downloading the New Software Release File to Optimux-108

Optimux-108 stores two software versions, each of them in one of the two partitions of its flash memory, which also contains a boot program. The software is stored in compressed format. The active version is decompressed and loaded into the Optimux-108 RAM upon power-up. The passive software is kept for

backup purposes. By default, Optimux-108 is delivered with the active software only.

New software releases are distributed as an **\*.img** file, which is downloaded to the local Optimux-108 using the TFTP or XMODEM protocol. Upon downloading, the new software release becomes active, the former active software turns into backup, and the former backup is erased.

If a failure occurs during downloading or decompression, the new version is erased from the flash and the backup version becomes active. In this case, only one version is left stored in the flash memory. If the active software becomes corrupted, you can replace it with its backup.

This procedure is used to replace the current software version with the new software release (**OP-106.img**).

## Downloading a New Software Release via TFTP

### ► To download the new software release file via TFTP:

1. From the SW & File Transfer menu, select **TFTP** (*Figure 6-3*) (Main menu > File Utilities > SW & File Transfer > SW Download > TFTP).

```

Optimux-108
Utilities>File Utilities>SW & File Transfer>TFTP

1. Server IP          ...      (172.17.140.200)
2. Remote File Name   ...      ( )
3. Command            >       (No Operation)
   Transfer Status     >       (No Operation)
   Transfer Error      >       (No Error)

>
Please select item <1 to 3>
ESC-Previous menu; !-Main Menu; &-Exit                      1 User(s)

```

*Figure 6-2. TFTP Menu*

Once an IP address is inserted, the "Command" line appears.

*Table 6-1. TFTP Parameters*

Parameter	Possible Values	Description
Server IP	<b>Default: 0.0.0.0</b>	IP address of the server to which the file will be uploaded or downloaded.
Remote File Name	String of up to 40 characters	Name of the file to download from server or upload to server.
Command	No Operation Software Download Software Upload Configuration File Download Configuration File Upload	Downloads software from the server Uploads current software version to the server



Parameter	Possible Values	Description
Transfer Status		Current status of the TFTP download.
	No operation	No TFTP transfer is in process
	Connecting	Initiating a TFTP connection.
	Transferring data	TFTP data transfer is in process.
	Ended Time out	The transfer terminated because the Retry Timeout or Total Timeout was exceeded.
	Ended OK	The file was successfully transferred.
Transfer Error	Error	The transfer terminated because an error occurred. Check the Transfer Error parameter for details about the error.
	No error	Error code when Transfer Status is <b>Error</b> . This parameter provides specific details of the error that occurred while attempting to download the file.
	Error resources	
	Error timeout	This parameter is set to No error unless an error is detected.
	Error use msg	
	Error nofile	
	Error access	
	Error disk full	
	Error illegal op	
	Error bad tid	
	Error exists	
	Error no user	

2. From the TFTP menu, perform the following steps:

1. Choose **Server IP** and enter the IP address of the server from which you want to download the new software file.
2. Choose **Remote File Name** and enter the name of the file you want to download.
3. Choose **Command** and then choose **Software download**.

The download process begins.

The Transfer Status field indicates the current status of the download.

## Downloading a New Software Release via XMODEM

### Notes

- *Installation of the new software releases via XMODEM is not possible over Telnet.*
- *To minimize the software downloading time, it is recommended to configure the CONTROL port to the highest available data rate.*

### ➤ To download a new software release via XMODEM:

1. From the SW & File Transfer menu, select **XMODEM** (Utilities > File Utilities > SW & File Transfer > XMODEM).

Optimux-108 responds with the following string:

**PLEASE OPEN XMODEM APPLICATION.**

**For exit press Q(uit)**

If you press <Q>, Optimux-108 aborts the download process and displays **Download failure. Press Esc to continue.** message in addition to the previous display.

3. Send the \*.img file to Optimux-108 using the XMODEM protocol of your terminal application.

Once downloading is complete, Optimux-108 decompresses the release file, displaying the following message:

**Final process download. Reset device after 5 seconds**

After the decompression, Optimux-108 is automatically reset. This causes the new software to be loaded into the modem's RAM.

---

**Note** *You need to run an XMODEM application on the remote computer to invoke the download.*

---

---

## 6.5 Upgrading Optimux-108 Software via the Boot Menu

Software downloading may also be performed using the Boot menu. The Boot menu can be reached while Optimux-108 performs initialization, for example, after power-up.

You may need to start the loading from the Boot menu when it is not possible to activate TFTP from the Download/upload using TFTP menu (for example, because the Optimux-108 software has not yet been downloaded or is corrupted).

---

**Caution** The Boot menu procedures are recommended only for use by authorized personnel, because this menu provides many additional options that are intended for use only by technical support personnel.

---

Two software downloading options are available from the Boot menu:

- Downloading using the XMODEM protocol. This is usually performed by downloading from a PC directly connected to the CONTROL port of the unit.
- Downloading using the TFTP. This is usually performed by downloading from a remote location that provides an IP communication path to an Ethernet port of Optimux-108.

### Using the XMODEM Protocol

Use the following procedure to download the new software release to Optimux-108 via XMODEM.

1. Verify that the \*.img file is stored on the PC with the terminal application.

2. Configure the communication parameters of the selected PC serial port for asynchronous communication for 115.2 kbps, no parity, one start bit, eight data bits and one stop bit. Turn all types of flow control off.
3. Turn off Optimux-108.
4. Activate the terminal application.
5. Turn on Optimux-108 and immediately start pressing the **<Enter>** key several times in sequence until you see the Boot screen. A typical screen is shown below (the exact version and date displayed by your Optimux-108 may be different).

**Note** *If you miss the timing, Optimux-108 performs a regular reboot process (this process starts with **Loading** and ends with a message to press **<Enter>** a few times to display the log in screen).*

```
RAD Optimux-106 Boot Version 1.00 (Nov 9 2004)
RAD Boot Manager Version 7.01 (Nov 9 2004)

0 - Exit Boot-Manager
1 - Dir
2 - Set Active Software Copy
3 - Delete Software Copy
4 - Download Files or an Application by XMODEM
5 - Format flash
6 - Show basic hardware information
7 - Reset board
8 - System Configuration.
9 - Download an Application by TFTP
Press the ESC key to go back to the Main Menu.
Select:
```

Figure 6-3. Boot Manager Menu

► To download software release via XMODEM:

1. From the Boot menu, select Download an Application by XMODEM. You will see a message that requests the partition number to which the new software is to be downloaded, and offers a recommended value.
2. If there is no special reason to select a different value, type the recommended number and then press **<Enter>**. A typical display is shown below:

```
Select Copy number for download ( 1 )
Select: 1
```

3. The process starts, and you will see:

```
Erasing Partition please wait ....
Please start the XMODEM download.
```

4. Start the transfer in accordance with the program you are using. For example, if you are using the Windows HyperTerminal utility:
  - Select **Transfer** in the HyperTerminal menu bar, and then select **Send File** on the **Transfer** menu.

The **Send File** window is displayed:

- Select the prescribed Optimux-108 software file name (you may use the **Browse** function to find it).
- In the **Protocol** field, select **XMODEM**.
- When ready, press **Send** in the **Send File** window. You can now monitor the progress of the downloading in the **Send File** window.

**Note** *If downloading fails, repeat the whole procedure.*

5. When the downloading process is successfully completed, you will see a sequence of messages similar to the following:

```

Loading ...
Decompressing to RAM.

Processing archive: FLASH
Extracting OP106.BIN
..... CRC OK
Running ...
*****
* In order to start working - press the ENTER button for few times*
*****

```

6. At this stage, press the **<Enter>** key several times to go to the log in screen.

## Using the TFTP

Use the following procedure to download software release to Optimux-108 via TFTP.

1. Verify that the \*.img file is stored on the PC with the TFTP server application.
2. Define IP parameters via the Boot Manager menu.
3. Activate the TFTP server application.
4. Download the \*.img file from the PC to Optimux-108.

### ➤ To define IP parameters via the Boot Manager menu:

1. From the Boot Manager menu (*Figure 6-4*), select **System Configuration** to start the configuration of the Optimux-108 IP communication parameters, as needed for TFTP transfer.

The parameters are displayed in consecutive lines. For each parameter, you can accept the current values by simply pressing **<Enter>** to continue, or type a new value:

- **IP Address:** used to select the IP address of Optimux-108. To change the current value, type the desired IP address in the dotted quad format, and then **<Enter>** to continue.

- **IP Mask:** used to select the IP subnet mask of Optimux-108. To change the current value, type the IP subnet mask address in the dotted quad format, and then **<Enter>** to continue.
- **Default Gateway Address:** when the TFTP server is located on a different LAN, you must define the IP address of the default gateway to be used by Optimux-108. Make sure to select an IP address within the subnet of the assigned Optimux-108 IP address. To change the current value, type the desired IP address in the dotted quad format, and then **<Enter>** to end the configuration.

If no default gateway is needed, for example, because the TFTP server is attached to the same LAN as Optimux-108 being loaded, enter **0.0.0.0**.

2. Press **<Enter>** to display the Boot menu.
3. Select **Perform Reset to the board** to reset Optimux-108. The new parameters take effect only after the resetting is completed.

➤ **To download software from the Boot menu using TFTP:**

1. From the Boot menu, select **Download an Application by TFTP** and then press **<Enter>** to start the TFTP transfer.

**Please Enter the Target File Name** message is displayed.

2. Enter the name of the desired software distribution file (make sure to include the path, when necessary). When done, press **<Enter>** to continue.

**Please Enter the Server IP address** message is displayed.

3. Enter the IP address of the server on which the software distribution file resides and then **<Enter>** to continue.

If no errors are detected, the downloading process starts, and the screen displays its relative progress.

4. After the transfer is successfully completed, return to the Boot menu and select **Exit Boot-Manager**.

When the Optimux-108 initialization is ended, the unit loads the new software.

---

**Note** *If downloading failed, repeat the whole procedure.*

---



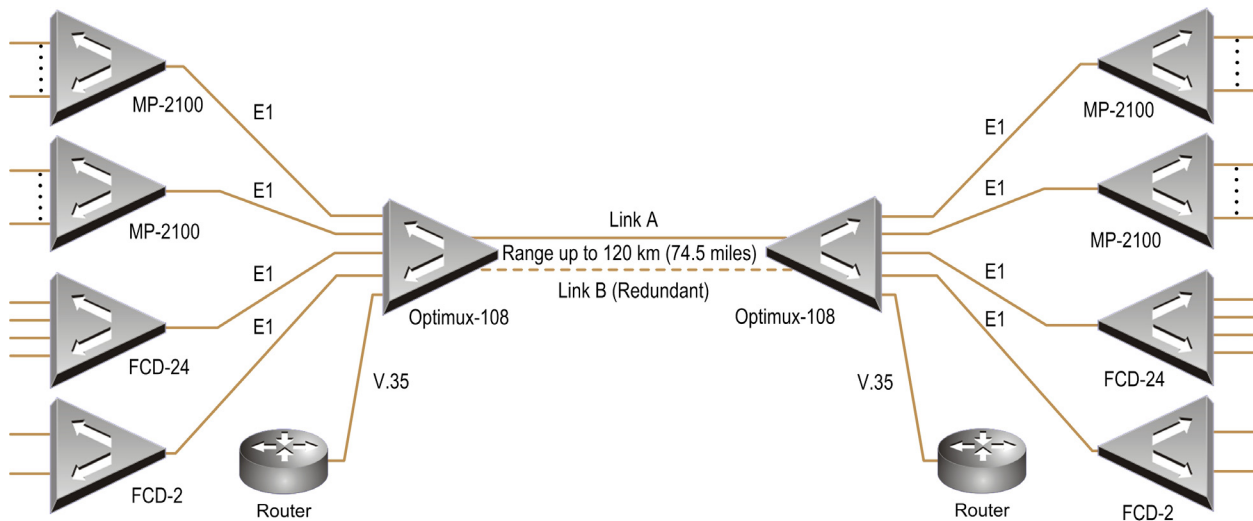
# Chapter 7

---

## Configuring a Typical Application

This chapter gives detailed instructions for configuring Optimux-108 for a typical application.

A terminal can be used to configure a local Optimux-108. However, to configure remote units, Telnet or SNMP is required. [Figure 7-1](#) illustrates a point-to-point connection extended by a pair of Optimux-108 units.



*Figure 7-1. Optimux-108 with V.35 port Point-to-Point Application*

---

### 7.1 Configuring the Optimux-108 Units

► To prepare a control session:

1. Connect all Optimux-108 connectors to the appropriate media.
2. Turn on the control terminal.
3. Configure the terminal to the default communication parameters:  
115,200 baud, 8 bits/character, 1 stop bit, no parity, flow control: none.
4. Set the terminal emulator to VT100 emulation.

You are now ready to start a control session.

➤ To enter user name and password:

1. Type in you user name.

**Note**

---

Enter **su** or **SU** for full configuration and monitoring access.

---

2. Type in your password at the > prompt (up to eight characters).

Optimux-108 responds to your entry with asterisks.

**Note**

---

The default password is **1234**.

---

3. Press <Enter>.

The Main menu is displayed.

---

---

## 7.2 Configuring the System Parameters

➤ To configure the Optimux-108 system parameters:

1. Configure the MNG Ethernet port (Main Menu>Configuration>Physical Layer>**Ethernet**).
2. Configure the channel type for each of the E1 ports (Main Menu>Configuration>Physical Layer>**E1**).
3. Configure the Uplinks (Main Menu>Configuration>Physical Layer>**Link**).
4. Configure the V.35 port (one side to Internal and the other side to LBT) (Main Menu>Configuration>Physical Layer>**V.35**).
5. Configure the Masking of the System alarms (Configuration>System>**Alarms**).
6. Configure the Masking of the Physical Layer parameters independently for each parameter: MNG-ETH, E1, Link, V.35 (the paths of these parameters appear in steps 1 to 4).

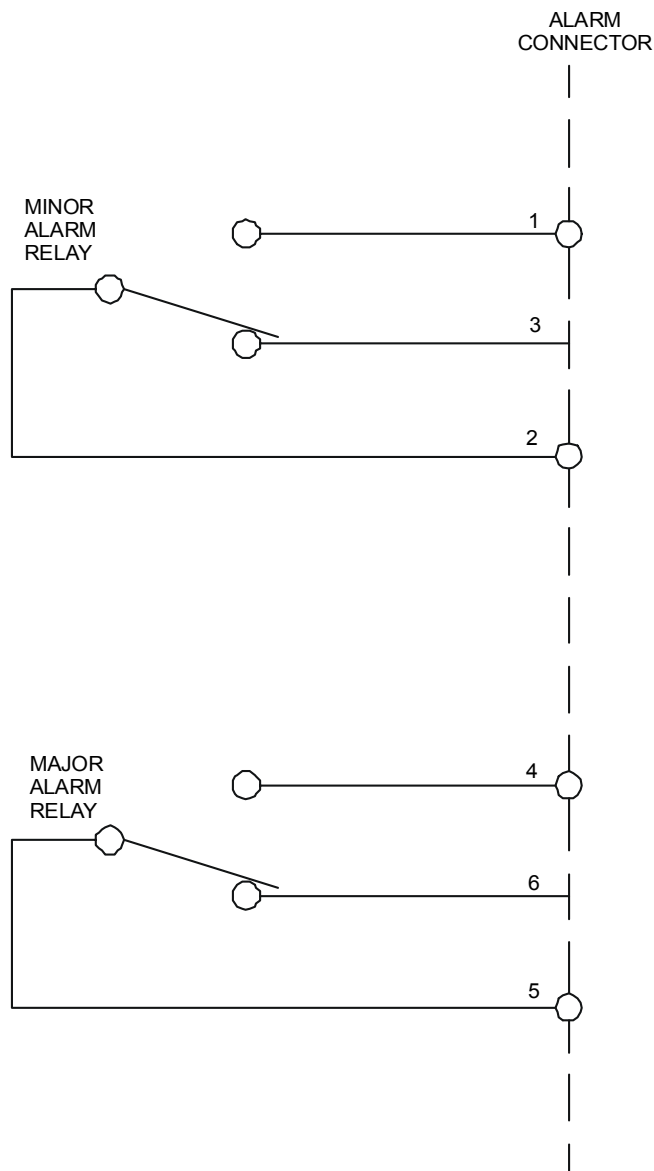


# Appendix A

## Pinouts

### A.1 Alarm Connector

The Optimux-108 ALARM connector is an RJ-45 connector, which includes the contacts of the major and minor alarm relays. [Figure A-1](#) shows the pin functions. The relay positions are shown in the non-energized (alarm active) state.



*Figure A-1. ALARM Connector Wiring*

Connection of the alarm port is made using a special cable with RJ-45 connector and DB9-female connector – CBL-RJ45-DB9/F. Its pin assignment is listed in [Table A-1](#).

*Table A-1 Alarm Cable Pin Assignment*

RJ-45	DB-9
1	1
2	6
3	2
4	4
5	9
6	5

## A.2 Control Port Connector

The optional Optimux-108 supervisory port has a standard RS-232 DCE interface. The physical interface is a mini USB connector, designated CONTROL. [Table A-2](#) lists the pinout for this connector.

*Table A-2. CONTROL Mini-USB Connector Pin Assignment*

Pin	Designation	Function	Direction
1	–	CAP to GND	–
3	RX	Receive	Input
2	TX	Transmit	Output
5	GND	Ground	–
4	RS-232 Enable	–	Input

RAD supplies a special control cable, CBL-MUSB-DB9F, for connection of this mini USB connector to the supervision terminal. Its pinout is given in [Table A-3](#).

*Table A-3. CONTROL Cable Pin Assignment*

2		2
3		3
4		5
5		
SHELL	DRAIN+BRAID	SHELL
P1	COLOR	P2
CONNECTION TABLE		

### A.3 MNG-ETH and USER-ETH Port Connectors

The pinout of both Ethernet connectors (MNG-ETH and USER-ETH) is the same and listed in [Table A-4](#).

*Table A-4. Ethernet Connector Pin Assignment*

Pin	Designation	Function	Direction
3	RX+	Receive – positive lead	Input
6	RX-	Receive – negative lead	Input
1	TX+	Transmit – positive lead	Output
2	TX-	Transmit – negative lead	Output
4, 5, 7, 8	–	CAP to GND	–

### A.4 Tributary E1 Port Connectors

The tributary interface has four E1 RJ-45 connectors (for the balanced link interface) or four dual BNC connectors (for the unbalanced interface).

The pin assignment of the E1 RJ-45 connector is given in [Table A-5](#).

*Table A-5 E1 RJ-45 Connector Pin Assignment*

Pin	Designation	Direction	Function
1	RD(R)	Input	Receive Data (Ring)
2	RD(T)	Input	Receive Data (Tip)
4	TD(R)	Output	Transmit Data (Ring)
5	TD(T)	Output	Transmit Data Tip
3, 6, 7, 8	–	–	Not connected

### A.5 V.35 Interface Connector

The pin assignment for the V.35 Interface connector (Smart serial) is listed below.

*Table A-6. V.35 Interface Connector Pinout*

Pin Number	Pin Name	Pin Description	Type (Input/Output)
1	TXDA	Transmit data A	Input
2	ETCA	External clock A	Input

Pin Number	Pin Name	Pin Description	Type (Input/Output)
3	TXCA	Transmit clock A	Output
4	RXCA	Receive clock A	Output
5	RXDA	Receive data A	Output
6	DCD	Data and Carrier Detect	Output
7	DTR	Data Terminal Ready	Input
8	RTS	Request To Send	Input
9	RLB	Remote Loopback	Input
10	LLB	Local Loopback	Input
11	CTS	Clear To Send	Output
12	DSR	Data Set Ready	Output
13	TEST_MODE	Test Mode	Output
14	TXDB	Transmit data B	Input
15	ETCB	External clock B	Input
16	TXCB	Transmit clock B	Output
17	RXCB	Receive clock B	Output
18	RXDB	Receive data B	Output
19	NC	Not connected	
20	NC	Not connected	
21	NC	Not connected	
22	NC	Not connected	
23	NC	Not connected	
24	NC	Not connected	
25	NC	Not connected	
26	GND	Ground	GND

The following tables list the pinout of three interface cables **CBL-AMP-DB25-TLBS**, **CBL-AMP-DB25-ISO2110**, and **CBL-AMP-M34**, which can be ordered from RAD for connecting the V.35 connector to the Telebras DB25, ISO 2100 DB25 or M34 Interface, respectively.

*Table A-7. CBL-AMP-DB25-TLBS Pin Assignment*

Smart Serial Pin No.	DB25 Telebras Pin No.
1	2
2	11
3	3

Smart Serial Pin No.	DB25 Telebras Pin No.
4	6
5	4
6	10
7	NC
8	5
9	23
10	8
11	7
12	9
13	12
14	15
15	24
16	16
17	19
18	17
26	13
Chassis (GND)	1

Table A-8. CBL-AMP-DB25-ISO2110 Pin Assignment

Smart Serial Pin No.	DB25 ISO2110 Pin No.
1	2
2	24
3	15
4	17
5	3
6	8
7	20
8	4
9	21
10	18
11	5
12	6
13	25
14	14

Smart Serial Pin No.	DB25 ISO2110 Pin No.
15	11
16	12
17	9
18	16
26	7
Chassis (GND)	1

*Table A-9. CBL-AMP-M34 Pin Assignment*

Smart Serial Pin No.	M34 Pin No.
1	P
2	U
3	Y
4	V
5	R
6	F
7	H
8	C
9	N
10	L
11	D
12	E
13	NN
14	S
15	W
16	AA
17	X
18	T
26	B
Chassis (GND)	A

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